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THESIS

THE EMERGENCE OF ORGANIZATIONAL FIT: APPLYING CONFIGURATION THEORY TO THE SNOHOMISH COUNTY (WA) EMERGENCY OPERATIONS CENTER

by

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March 2016

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From that case study, three workgroups were selected, and members of each workgroup were interviewed. The results were analyzed twice, first by distinct workgroup and then cumulatively. Among the findings is the diversity of influences on the task environments of different workgroups responding to the same incident; the findings also reveal that the groups implemented aspects of more than one structure. Based on these analyses, recommendations are made to update EOC doctrine and training to focus on situational factors and flexible configurations, including hybrid configurations. And while the setting for this research is a local EOC, its outcomes reinforce the applicability of configuration theory to any organization responding to a crisis.

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THE EMERGENCE OF ORGANIZATIONAL FIT: APPLYING CONFIGURATION THEORY TO THE SNOHOMISH COUNTY (WA) EMERGENCY OPERATIONS CENTER

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An emergency operations center (EOC) plays a critical role during a community's response to a disaster. Yet, little research exists that assesses the impact of the organization's structure on an EOC staff's performance. This thesis explores how configuration theory, which emphasizes the need for an organization's structure to fit the situation, can help emergency managers organize an EOC's staff to improve its performance. Specifically, it uses configuration theory to examine the Snohomish County (WA) EOC's response to the State Route 530 flooding and mudslides incident.

From that case study, three workgroups were selected, and members of each workgroup were interviewed. The results were analyzed twice, first by distinct workgroup and then cumulatively. Among the findings is the diversity of influences on the task environments of different workgroups responding to the same incident; the findings also reveal that the groups implemented aspects of more than one structure. Based on these analyses, recommendations are made to update EOC doctrine and training to focus on situational factors and flexible configurations, including hybrid configurations. And while the setting for this research is a local EOC, its outcomes reinforce the applicability of configuration theory to any organization responding to a crisis.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAR	After Action Report
CEMP	Comprehensive Emergency Management Plan
DHS	Department of Homeland Security
EOC	Emergency Operations Center
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency
ICP	Incident Command Post
ICS	Incident Command System
IEMC	Integrated Emergency Management Course
MACS	Multiagency Coordination System
NGO	Non-Governmental Organization
NIMS	National Incident Management System
PNP	Private/Nonprofit Organization
SCDEM	Snohomish County Department of Emergency Management
SCEOC	Snohomish County Emergency Operations Center

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EXECUTIVE SUMMARY

A community's emergency operations center (EOC) plays a critical role during the response to large-scale incidents.[1] But despite its importance, current EOC doctrine addressing how to organize the staff of an EOC seems incomplete, as do training opportunities for EOC staff.[2] Current emergency management doctrine and training focus on the incident command system (ICS), which is intended to manage field-level operations.[3] EOCs present a different environment than that for which the ICS structure was designed, and it is incumbent on individual jurisdictions to structure their EOCs in manners they think will maximize their members' efficiency and effectiveness.

Configuration theory, an extension of structural contingency theory, offers concepts and principles that might improve an EOC staff's performance. Configuration theory holds that systematic relationships exist between an organization's task environment and the configuration of its organizational features, and that a closer fit between the task environment and structural features results in a greater likelihood of successful organizational performance.

This thesis examines different parts of an EOC's response to a large-scale incident using the lens of configuration theory. It relies heavily on the work of Henry Mintzberg, one of the early configuration theorists, who argued that, "The elements of structure should be selected to achieve an internal consistency or harmony, as well as a basic consistency with the organization's situation."[4] Mintzberg hypothesized that most organizations naturally fall into five basic configurations; he also recognized that some

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[1] Ronald W. Perry, "Emergency Operations Centres in an Era of Terrorism: Policy and Management Functions," *Journal of Contingencies and Crisis Management* 11, no. 4 (December 2003): 151.

[2] G. Kemble Bennet, *Recommendations on the Emergency Operations Center's Role in NIMS* (Memorandum; Washington, DC: Federal Emergency Management Agency [FEMA] National Advisory Council [NAC], August 11, 2009).

[3] Department of Homeland Security (DHS), *National Incident Management System* (Washington, DC: Government Printing Office, 2008), 46.

[4] Henry Mintzberg, *Structure in Fives: Designing Effective Organizations* (Edgewood Cliffs, NJ: Prentice-Hall, 1983), 3.

organizations are characterized by properties shared by two or more of the basic configurations. Mintzberg considered these to be hybrid organizations.

This research used a single-case study design with embedded units of analysis. The author conducted interviews with three representatives from three workgroups (nine total interviews) that were part of the response by the Snohomish County (WA) EOC (SCEOC) to the State Route (SR) 530 flooding and mudslides incident. That incident, the deadliest mudslide in U.S. history, involved hundreds of responders and affected numerous communities. The three workgroups—the Snohomish County EOC's Logistics Section, the SR 530 Task Force, and the Human Services Multiagency Task Force—were selected because they performed distinct tasks, on different timelines, and in different task environments. The author, a participant–observer who was indirectly involved with the workgroups, was also aware that they organized differently.

This research found that the groups experienced different factors that affected their respective task environments and that they adopted structures characterized by different structural properties. The SCEOC Logistics Section, which supported the resource needs of the incident, preexisted the case study. As disaster logistics doctrine and training indicate, it used a standardized work process in previous exercises and incidents; during this response, it found that process overwhelmed. Because the section's leaders needed to act very quickly, they took a more prominent role; the group's members, in order to address the complexity of the resource requests, coordinated directly with each other.

The SR 530 Task Force formed after the incident; its task was planning how to clear the debris from SR 530 so the road could be reopened. There was no previous knowledge of this type of planning, and the task force was working under significant time constraints. The expertise of the members helped them identify solutions to the problems posed by this novel situation, and their facilitator became instrumental in coordinating the *timely* efforts of the disparate disciplines. The third group was the Human Services Multiagency Task Force. Like the SR 530 Task Force, it formed after the incident with the task of supporting the survivors of the tragedy. This group's size approached 200, and the creation of the task force was meant to coordinate the efforts to provide services to

meet a broad spectrum of need as quickly as possible in an evolving environment. The representatives of the agencies were experts in their respective areas of service and committed to helping people; however, the lack of a singular authority to direct them led to duplicated efforts.

All of the groups felt disparate pulls that meant they adopted facets of multiple configurations (i.e., they "hybridized" their configuration), especially as they moved from decision-making to problem solving. Each also interacted with a large number of external factors and stakeholders, experienced a lack of consistent staffing, and felt the pressure created by time criticality. In some cases, an understanding of configuration theory might have led to the earlier implementation of different structural properties that could have improved the organization's performance. Although unable to travel back in time and definitively verify such assertions, this study demonstrates the benefits of understanding the relationship between the task environment and the configuration. It provides examples of how specific structural properties enhanced or hindered the analyzed groups' performance, and thus it recommends that EOC doctrine and training, and emergency management education in general, expand to include configuration theory.

There is a dearth of qualitative or quantitative research on the performance of EOCs. This research, an examination of an extreme case,[5] offers unique insights and introduces the opportunities for many future studies. The staff in an EOC must perform well. Configuration theory offers a way that might ensure that.

[5] Robert K. Yin, *Case Study Research: Design and Methods*, 4th ed., Applied Social Research Methods Series, Vol. 5 (Thousand Oaks, CA: Sage, 2009), 47.

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I received an incredible amount of support throughout this endeavor, without which I could not have completed either the program or this thesis. For the small group of friends and family that forms my inner circle, words are never sufficient to express my gratitude.

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Finally, I would like to pay my respects to the families and friends of the 43 victims of the SR 530 incident. I would also like to recognize the survivors, community

members and leaders, responders, and volunteers who were part of the response to this tragedy. You are, and will always be, “Oso Strong.”

I. INTRODUCTION

> Architecture does not create extraordinary organizations by collecting extraordinary people. It does so by enabling very ordinary people to perform in extraordinary ways.
>
> — John Kay, *Foundations of Corporate Success: How Business Strategies Add Value*

When a disaster occurs, a community's emergency operations center (EOC) plays an integral part in the response.[1] The EOC's role becomes particularly critical during the response to large-scale, low-probability incidents.[2] Because of this, to paraphrase the quote above, enabling the ordinary people who staff EOCs to perform extraordinarily is a goal for emergency management professionals across the country. This research explores a way to achieve that goal.

This thesis examines different parts of an EOC's response to a large-scale incident through the lens of configuration theory. Configuration theory describes how order can emerge from the interactions between different parts of an organization.[3] It is an extension of contingency theory, a branch of organizational theory that holds that the most effective organizational structure is one based on the situation.[4] Using these theories allows managers to implement organizational features that fit their groups' situations. Thus, this thesis hypothesizes that EOC managers who implement the tenets of these theories will see their staff members perform more effectively and efficiently.

For this thesis, a case study is used to illustrate the relationship between organizational structures, the environments in which they operate, and their performance.

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[1] E. L. Quarantelli, *Ten Criteria for Evaluating the Management of Community Disasters* (Preliminary Paper #241; Newark, DE: University of Delaware Disaster Research Center, 1996), 16.

[2] Ronald W. Perry, "Emergency Operations Centres in an Era of Terrorism: Policy and Management Functions," *Journal of Contingencies and Crisis Management* 11, no. 4 (December 2003): 151.

[3] Alan D. Meyer, Anne. S. Tsui, and C. R. Hinings, "Configurational Approaches to Organizational Analysis," *Academy of Management Journal* 36, no. 6 (1993): 1178.

[4] Lex Donaldson, "The Contingency Theory of Organizational Design: Challenges and Opportunities," in *Organization Design: The Evolving State-of-the-Art*, ed. Richard M. Burton et al. (New York: Springer Science + Business Media, 2006), 19.

The case study reviews an incident that occurred in northwest Washington and was the deadliest mudslide in U.S. history. On March 22, 2014, the Snohomish County EOC (SCEOC) activated following an enormous mudslide that swept through a subdivision, destroying numerous homes and killing 43 people. The SCEOC's staff coordinated the support to the response, and over the course of the next 40 days, a number of teams were formed to address a variety of issues that arose in the aftermath of this disaster.

This research examines three distinct workgroups that formed to address specific tasks during the response. One of these groups was the SCEOC Logistics Section, which was responsible for procuring resources to support the initial search and rescue and the subsequent search and recovery. The second group was the team that planned the debris clearing, which became known as "The SR 530 Task Force." Its task was identifying a way to quickly remove the debris from State Route (SR) 530, debris that needed to be deliberately searched for remains and personal belongings. The final group was the Multiagency Task Force, which was the team tasked with meeting the human service needs of the survivors.

The author reviewed configuration theory literature, focusing on Henry Mintzberg's work. He then conducted interviews with three representatives from each workgroup and analyzed their insights. The analysis revealed factors that shaped each group's task environment and the nuances of the organizational structures each implemented. Analysis of the interview data identified variations in each group's configuration; it also identified themes that they all shared. Cumulatively, these findings may help EOC managers structure their staff to optimize their performance. They may also help shape future EOC doctrine and training.

A. THE EMERGENCY OPERATIONS CENTER AS A PROBLEM SPACE

Despite the significant role of the EOC, current EOC doctrine that discusses how to organize the staff of an EOC is incomplete, and training opportunities for EOC staff appear insufficient.[5] Current emergency management doctrine, codified in the National Incident Management System (NIMS) document, focuses on the incident command system (ICS), which is "used to organize on-scene operations."[6] The NIMS articulates 14 management characteristics that contribute to the "strength and efficiency" of the ICS.[7] Some of these may be applicable to an EOC, but the intended use of the ICS is at the field level. This is a distinct environment.

EOCs coordinate incident response on a macro level, often using a team composed of representatives from the government, non-governmental organizations (NGOs), and private or nonprofit organizations (PNPs) to coordinate the efforts of incident command posts (ICPs), the media, and other EOCs.[8] This presents the potential for a very different environment than that for which the ICS structure was designed. The lack of specific direction on how to best organize an EOC's staff makes it incumbent on individual jurisdictions to structure their EOCs in a manner they think will maximize their members' efficiency and effectiveness.

Doing so implies that EOC managers understand organizational design and the benefits of different configurations, knowledge that may not be readily available. Many emergency managers rely on the Federal Emergency Management Agency (FEMA) Emergency Management Institute (EMI) for training. Organizational design is not found in the EMI curriculum; nor, to a large degree, are courses focused specifically on EOCs. A scan of the list of EMI's online independent study courses shows EMI's training

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[5] G. Kemble Bennet, *Recommendations on the Emergency Operations Center's Role in NIMS* (Memorandum; Washington, DC: Federal Emergency Management Agency [FEMA] National Advisory Council [NAC], August 11, 2009).

[6] Department of Homeland Security (DHS), *National Incident Management System* (Washington, DC: Government Printing Office, 2008), 46. The NIMS dedicates 72 pages to ICS; it covers EOCs in two pages.

[7] Ibid., 46–49.

[8] Laura G. Militello et al., "Information Flow during Crisis Management: Challenges to Coordination in the Emergency Operations Center," *Cognition, Technology, and Work* 9 (2007): 25.

program reflects the doctrinal emphasis on ICS.[9] Thus, there are limited training opportunities available for an EOC staff trying to implement proper configurations to improve its efficiency and effectiveness for given situations and tasks.

There is also little empirical evidence upon which to rely. Despite its ubiquitous use by emergency responders, there are relatively few studies of the efficacy of the ICS,[10] and there are virtually no studies that focus on EOC operations. In the one study that could be located, Lutz and Lindell examined the utilization of the ICS within an EOC and concluded, "ICS implementation in Texas EOCs during Hurricane Rita left much to be desired."[11] No other research was found that specifically attempted to examine an EOC staff's performance or to identify specific organizational design elements that proved particularly useful in an EOC. This thesis endeavors to begin to fill that gap.

B. RESEARCH QUESTION

The principal question this thesis explores is how configuration theory can help emergency managers organize the staff of an EOC to improve its performance. Configuration theory specifies how relationships among contextual factors, such as the task environment and structural properties of an organization, relate to the performance. To answer the research question, the author analyzed three groups that performed distinct tasks during the response to the same large-scale incident and examined how their respective task environments and the structural properties they implemented influenced their performance.

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[9] Federal Emergency Management Agency (FEMA), "Independent Study Courses," last modified December 4, 2014, http://training.fema.gov/is/crslist.aspx?all=true. FEMA lists 10 courses on ICS and one on EOC.

[10] Gregory A. Bigley and Karlene H. Roberts, "The Incident Command System: High-Reliability Organizing for Complex and Volatile Task Environments," *Academy of Management Journal* 44, no. 6 (December 2001): 1281–99; Dick A. Buck, Joseph E. Trainor, and Benigno E. Aguirre, "A Critical Evaluation of the Incident Command System and NIMS," *Journal of Homeland Security and Emergency Management* 3, no. 3 (2006); Donald P. Moynihan, *From Forest Fires to Hurricane Katrina: Case Studies of Incident Command Systems* (Networks and Partnerships Series; Washington, DC: IBM Center for the Business of Government, 2007).

[11] Leslie D. Lutz and Michael K. Lindell, "Incident Command System as a Response Model within Emergency Operations Centers during Hurricane Rita," *Journal of Contingencies and Crisis Management* 16, no. 3 (September 2008): 132.

C. RESEARCH METHOD AND LIMITATIONS

A single-case study design with embedded units of analysis formed the framework for this thesis. The author, a participant–observer, conducted semi-structured interviews with three representatives from each of the selected workgroups (nine total interviews). The interview subjects had extensive familiarity with their respective team's structure and workings, and their responses were the primary source of data for this work. Documented reports and the author's insights were other sources of data.

There were constraints to this research. Yin listed "traditional prejudices" against the case study method, including its perceived lack of rigor and potential lack of generalization.[12] In addition, administrative regulations deriving from the Paperwork Reduction Act limited the number of interview subjects to nine. To offset this limitation on the number of subjects, those selected qualified under parameters established to try to ensure the highest quality of data. The interviews were conducted using a consistent protocol to increase the reliability of the study. To make the results more generalizable, the author eliminated configuration theory concepts that could become too narrowly focused or jurisdiction-specific. For example, there was no analysis of the effect of technology because jurisdictions rely on so many different technologies in their EOCs. Finally, a participant–observer research bias was an obvious risk due to the author's intimate knowledge of the incident and the response efforts. Recognizing that, readers should note that the author did not participate directly on any of the three teams. The author sought to only add information to fill gaps regarding the facts of the case when the interview subject, because of the author's familiarity with the situation, assumed an understanding.

D. SIGNIFICANCE OF RESEARCH

This research is exploratory in nature because, to the best of the author's knowledge, no study exists that examines how the configuration of an EOC's staff affects

[12] Robert K. Yin, *Case Study Research: Design and Methods*, 4th ed., Applied Social Research Methods Series, vol. 5 (Thousand Oaks, CA: Sage, 2009), 14–16. Yin also listed two other shortcomings of case studies: first, that they take too long, and second, that there is a perception that case studies are unable to establish causal relationships.

its performance. Thus, from a practical perspective, this work is the first analysis of an EOC structure's effectiveness and efficiency using configuration theory. It thus has the potential to improve EOCs across the country and to inform emergency management doctrine and EOC training. More generally, it adds to the existing body of work that comprises configuration theory and is useful for organizations performing work during a crisis.

E. OVERVIEW OF SUBSEQUENT CHAPTERS

This thesis uses the perspective of configuration theory to examine three workgroups that formed during the Snohomish County EOC's response to the SR 530 flooding and mudslides incident. Chapter II provides an overview of the incident and describes the overall structure of the EOC and the three workgroups. Chapter III contains a literature review that defines configuration theory, its relevant concepts and their relationships, and organizational performance. These two chapters create the contextual foundation and conceptual backdrop, respectively, for the analysis.

Chapter IV describes the research method, outlining the interview process and the way the responses were analyzed. Chapter V communicates the findings of the interviews. It uses the perspectives of the interview subjects to identify themes salient to the performance of their respective groups. Those themes are analyzed using the theoretical concepts outlined in Chapter III to show the relationship in each group among the contextual factors, the structures that emerged, and workgroup's performance. This chapter also includes a discussion of each group's configuration. Chapter VI concludes this research by describing some of the implications of this research and recommendations based on the findings.

II. CASE STUDY

A. BACKGROUND

Snohomish County, Washington, is a beautiful place to live. Located between King County to the south and Skagit County to the north, it is home to approximately 740,000 residents[13] who enjoy topography that ranges from the saltwater beaches of the Puget Sound found on the west side of the county to extensive forests and alpine wilderness in the mountains on the east side (see Figure 1). The cities and urban areas that comprise just 9% of the county's 2,090 square miles[14] are predominant in southwest part of the county. Two river basins, the Snohomish and Stillaguamish, traverse the southern and northern portions of the county, respectively.

Figure 1. Snohomish County, Washington

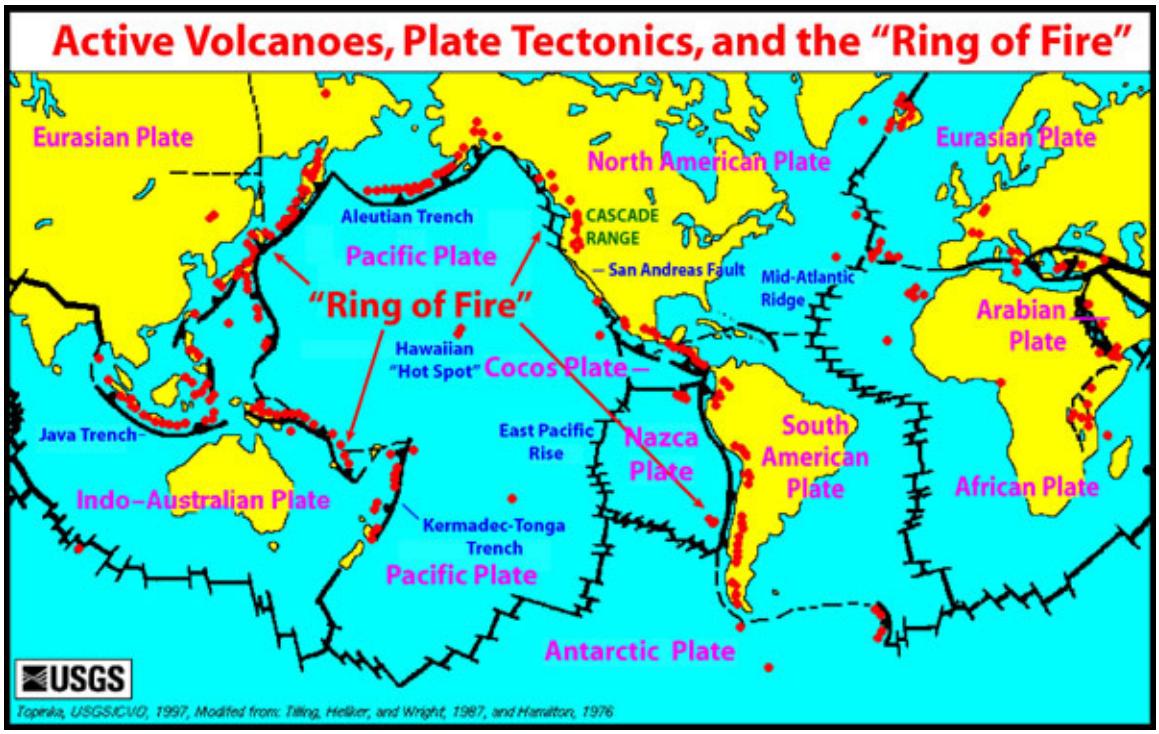
Source: Snohomish County Washington, "About Snohomish County," accessed April 21, 2015, http://snohomishcountywa.gov/2577/About-Snohomish-County.

[13] Office of Financial Management, *April 1, 2014 Population of Cities, Towns, and Counties used for the Allocation of Selected State Revenues, State of Washington* (Olympia: Washington State Office of Financial Management, April 1, 2014), http://www.ofm.wa.gov/pop/april1/default.asp.

[14] Snohomish County Washington, "About Snohomish County," accessed April 21, 2015, http://snohomishcountywa.gov/2577/About-Snohomish-County.

In addition to its beauty, Snohomish County is also fraught with natural hazards. Washington State sits on the edge of the seismically active "Ring of Fire" (see Figure 2), and the 2010 Snohomish County Natural Hazard Mitigation Plan (NHMP) listed eight natural hazards, including earthquakes, volcanoes, flooding, and "landslides and other mass movements."[15]

Figure 2. Active Volcanoes, Plate Tectonics, and the "Ring of Fire"



Source: National Oceanic and Atmospheric Administration, "Active Volcanoes, Plate Tectonics, and the 'Ring of Fire,'" *Ocean Explorer*, August 26, 2010, http://oceanexplorer.noaa.gov/explorations/05fire/background/volcanism/media/tectonics_world_map.html.

Preparing for those hazards is a core responsibility of the Snohomish County Department of Emergency Management (SCDEM). The SCDEM maintains the NHMP

[15] TetraTech Engineering and Architecture Services, *Snohomish County Natural Hazard Mitigation Plan Update, Volume 1: Planning-Area-Wide Elements* (Seattle: TetraTech Engineering & Architecture Services, September 2010), 8–2, http://snohomishcountywa.gov/DocumentCenter/View/14607. The plan listed one technological hazard (dam failure) for a total of nine hazards. Note that Snohomish County completed an update to its mitigation plan in 2015. This research cited the 2010 plan because it was current at the time of the SR 530 incident.

and plans for the hazards it identifies. The most recent addition to Snohomish County's structure, the SCDEM became a county department in 2006. It provides emergency management services to the unincorporated parts of the county, 18 incorporated jurisdictions, and two tribal nations.[16] Despite its newness to the county's structure, the SCDEM is experienced with disaster response. From 2006 to 2013, the department responded to seven incidents that became presidential disaster declarations[17] and a number of other less impactful disasters.

As part of its response efforts, the SCDEM maintains the SCEOC. The SCEOC is located in Everett, Washington, in a remodeled facility that the SCDEM occupied in 2012. Its operational floor is approximately 3,000 square feet, and it features current audiovisual, information technology, and communications technology. Staffing for the SCEOC comes from the SCDEM and organizations named as Emergency Support Function (ESF) primary agencies in the Snohomish County Comprehensive Emergency Management Plan (CEMP). Prior to the SR 530 incident, the EOC staff structured itself in what FEMA's EOC training refers to as a "hybrid" structure[18] that placed the ESF representatives within the ICS's functional groups of Operations, Planning, Logistics, and Finance/Administration (see Figure 3).

This structure worked well in 2010 when Snohomish County participated in an Integrated Emergency Management Course at FEMA's EMI, and again in 2012 during the Evergreen Quake Exercise Series. These were exercises, however, and the SCEOC had never *fully* activated in response to an actual disaster. That changed on March 22, 2014.

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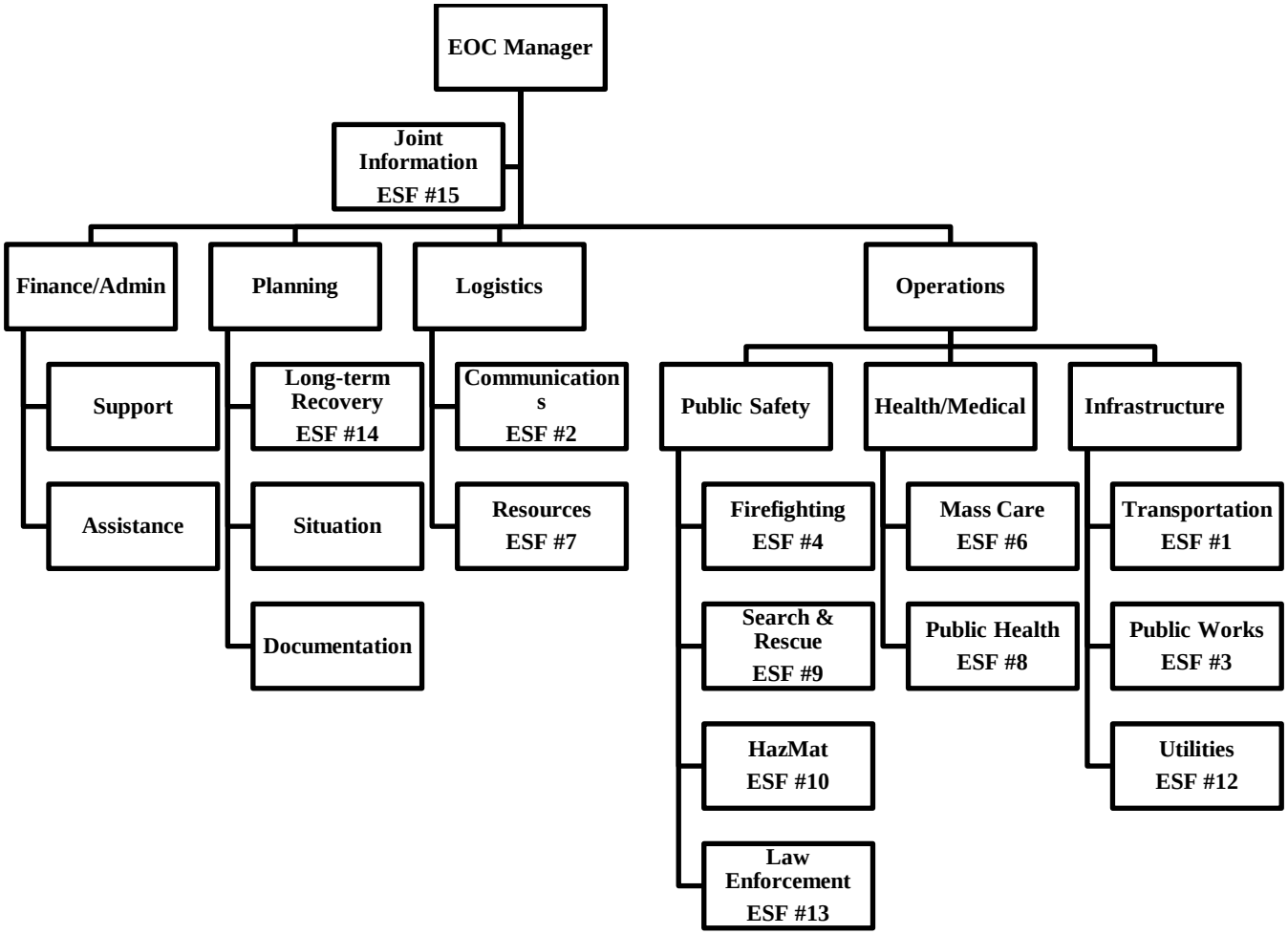
[16] Snohomish County Washington, "Emergency Management," accessed April 21, 2015, http://www.snohomishcountywa.gov/180/Emergency-Management.

[17] FEMA, "Disaster Declarations for Washington," accessed April 25, 2015, https://www.fema.gov/disasters/grid/state-tribal-government/89?field_disaster_type_term_tid_1=All.

[18] Federal Emergency Management Agency, *IS-775: EOC Management and Operations* (Emmitsburg, MD: Emergency Management Institute, September 19, 2012), sec. 3.

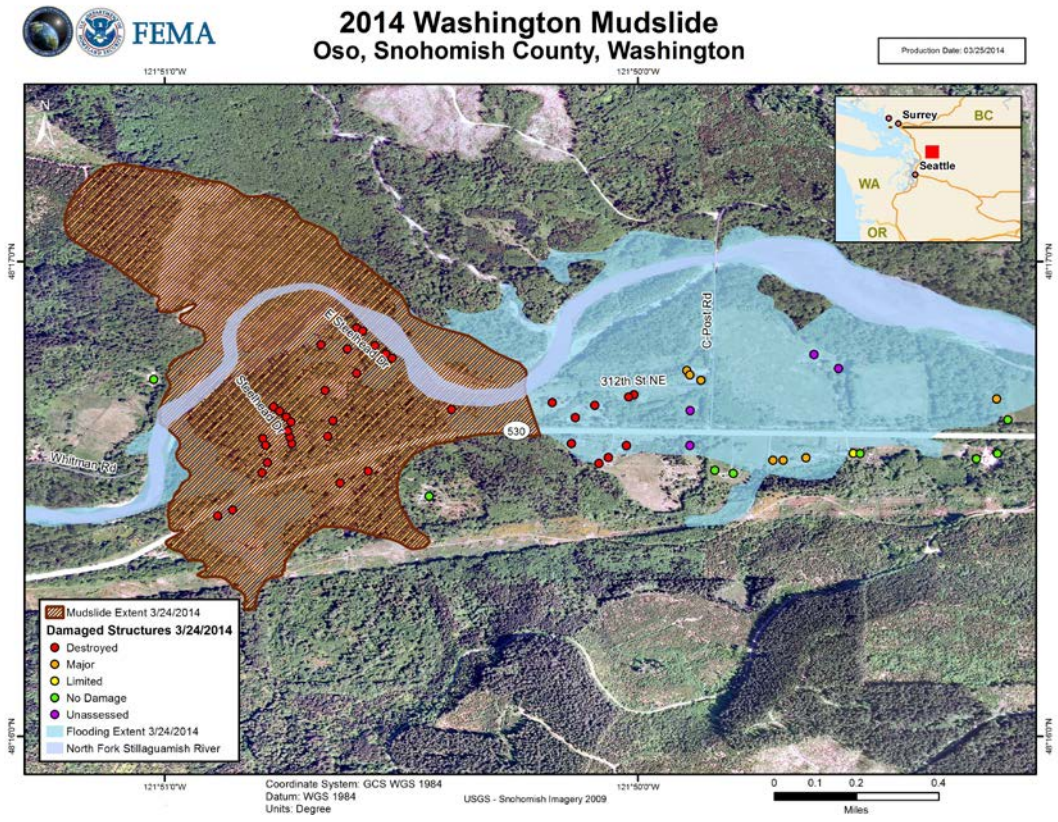
Figure 3. SCEOC's Organizational Structure for the Evergreen Quake 2012 Exercise



B. THE INCIDENT: THE SR 530 FLOODING AND MUDSLIDES

On Saturday, March 22, 2014, the deadliest mudslide in U.S. history occurred in Snohomish County, Washington. On that date, at 10:37 a.m., a massive slope released from a hillside east of the unincorporated community of Oso and raced south. It created an earthen dam that blocked the Stillaguamish River and slammed into the Steelhead Haven housing development. The force of the slide immediately destroyed 35 homes; subsequent flooding caused by the earthen dam would destroy or damage 20 more structures. When it stopped moving, approximately 10 million cubic yards of debris covered an area nearly one square mile, including approximately 2,000 linear feet of SR 530. In some places, the debris was 75 feet deep. The area affected by the mudslide is shown in Figure 4.

Figure 4. Snohomish County, Washington, Mudslide of 2014



Source: FEMA and USGS, "2014 Washington Mudslide" (Lynnwood, WA: FEMA Region 10, March 25, 2014), https://regions.services.femadata.com/arcgis/rest/services/FEMA_RX/NGA_Mudslide_Flooding_Extents_30242014/MapServer.

At 10:45 a.m., dispatchers issued the first callouts to response agencies; meanwhile, local residents learned of the slide and came to help. Responders and volunteers extracted 14 survivors; 13 of them survived. Over the next several weeks, dozens of local, state, and federal agencies deployed resources to assist in the search and recovery efforts. These personnel worked side by side with volunteers and equipment operators from the local communities, building a road to gain access to the debris field and tirelessly searching the debris. Eventually, they recovered all 43 of the victims.

While the search and rescue and subsequent search and recovery efforts were the priority, the slide caused a number of other issues. In its immediate aftermath, there were concerns that the earthen dam might fail catastrophically and send a wall of water downstream toward the city of Arlington, Washington. With SR 530 blocked, the 30-minute drive from Darrington to Arlington became a two-and-a-half-hour trip. Gaining access to the debris field required substantially improving a road typically used to check power lines. The slide also destroyed the fiber line that ran alongside the road, temporarily disrupting 911 dispatch services along with landline telephone and Internet service east of the slide.

Numerous agencies came to assist the survivors, some of whom had lost everything. Those survivors were not just in the immediate vicinity of the slide; it affected the entire Stillaguamish River Valley, which includes citizens and businesses in the town of Darrington, city of Arlington, three tribal nations (the Sauk-Suiattle, Stillaguamish, and Tulalip), and unincorporated Snohomish County. Managing all of these efforts—those focused on the victims and those focused on the survivors—was a massive undertaking. A series of incident management teams oversaw the efforts of the searchers in the immediate area of the slide. The SCEOC supported these teams and addressed the regional issues.

C. THE SNOHOMISH COUNTY EMERGENCY OPERATIONS CENTER

At 12:17 p.m. on March 22, the SCEOC activated. At first, the SCDEM staff that manned the SCEOC focused on gathering information and ascertaining the scale of the disaster. As the magnitude of the disaster became more apparent, it notified additional

ESF agencies. Those agencies provided more staff, and the SCEOC began supporting resource requests for the search efforts. In addition to the situational awareness and resources it provided to the incident site, the SCEOC staff identified support for the survivors, helped establish mechanisms for managing volunteers and donations, and coordinated communications between multiple jurisdictions and legal authorities. Eventually, every ESF became involved, and for the first time, the SCEOC was fully activated for a "real world" incident.

During this response, the SCEOC implemented a structure similar to the one it used in the 2012 exercise. This research analyzes three of the EOC's teams to determine how their respective task environment impacted them, what types of structural properties they incorporated, and how they perceived their performance; it also discusses how each workgroup configured itself. The three groups were those that handled logistics, planned for debris clearing, and attended to the human service needs of the survivors.

1. Logistics: The SCEOC Logistics Section

The SCEOC established its Logistics Section shortly after it activated for the SR 530 incident. A core responsibility of an EOC is to provide resources to support an incident response,[24] and resource management relies on standardized processes.[25] The SCEOC had practiced its resource management processes during previous exercises and smaller scale disasters. It had not, however, implemented those processes for an incident of this magnitude.

During this incident, the section interacted with dozens of local, state, and federal agencies and processed an extraordinary (for Snohomish County) volume and diversity of resource orders, many of which needed to be filled with a measure of immediacy. The responders from these agencies needed food, showers, and places to sleep; they also needed augmentation of their personal gear to ensure their safety and ability to communicate with each other. A variety of heavy machinery was needed, first to gain access to the debris field and, when access was established, to help the searchers combing

[24] DHS, "National Incident Management System," 66.

[25] Ibid., 33.

through a combination of displaced earth, trees, shattered houses, vehicles, and personal belongings. These machines, and the fuel and parts needed to support them, had to be ordered.

There were also specialized resource requirements. Everything leaving the site needed to be decontaminated because of the presence of hazardous household materials; this necessitated a decontamination unit. Personal belongings of the affected families had to be carefully cleaned and stored. Managing the river's channel required specialized equipment and expertise, as did monitoring the hillside from which the slide originated. There were resources needed to ensure the security of the scene, to treat the human and canine searchers that experienced medical problems, and to provide information to the media.

The Logistics Section processed all of these resource requests, many more than it ever had previously. Typically staffed with less than 10 people, it was consistently staffed with approximately double that number in an attempt to keep pace with the resource demands. Many of those extra staff members came from agencies outside of Snohomish County.

2. Debris Clearing: The SR 530 Task Force

Disaster managers prioritized clearing SR 530 very early in the response to the mudslide. The blockage of the road meant that residents east of the slide were faced with extended travel times to the west—to the jobs, schools, and services found along the I-5 corridor. It also prevented eastbound traffic, particularly the summer tourists upon whom local businesses relied, from reaching the outdoor recreational opportunities abundant in the eastern half of the Stillaguamish Valley. The SR 530 Task Force, composed of 20 to 40 experts from different agencies, was tasked to figure out how to remove hundreds of thousands of cubic yards of debris of various types[26] and open the road as quickly as possible.

[26] Interview Subject C, SR 530 Task Force, December 18, 2014.

The presence of so many specialists was warranted. They were faced with the unique problem of balancing the competing needs to deliberately and thoroughly search the debris for remains and irreplaceable personal belongings with expeditiously removing the material so traffic could resume. Debris clearing had been done before in the county; the Snohomish County Disaster Debris Management Plan is one of the few FEMA-approved debris management plans in the region, and it had been partially implemented during previous weather and flooding incidents in the county. The presence of the remains, however, created an unprecedented situation. With the plan, the SR 530 Task Force had a starting point, but the experts needed to adjust it to this situation.

3. Human Services: The Multiagency Task Force

The Human Services Multiagency Task Force formed to meet the needs of the survivors. The powerful mudslide claimed 43 victims; it left many survivors who included the victims' relatives, neighbors, and members of the affected communities. Those communities included neighborhoods, incorporated jurisdictions, and three tribes. The survivors' needs were in some cases immediate, and in almost every case diverse. They ranged from food and shelter to the replacement of entire households. Many of the survivors were also coping with the loss of friends and loved ones.

At times, there were nearly 200 representatives from numerous agencies who worked to meet the spectrum of needs. The agencies and their representatives were nearly as disparate as the needs themselves and included public, private, and nonprofit entities. Some of them already had a presence in the affected communities; many came from throughout the state and country. Some provided disaster assistance as part of their regular operations, and others were operating in this environment for the first time. All of them were focused on assisting the survivors.

D. SUMMARY

The SR 530 flooding and mudslides incident was the deadliest mudslide in U.S. history. It involved hundreds of responders, and the initial response phase lasted nearly six weeks. Supporting these efforts was the staff of the SCEOC.

To address specific tasks, a number of workgroups formed from within the overarching construct of the SCEOC. This research examines three of those workgroups using configuration theory's concepts to demonstrate how understanding the relationship between task environment and organization can benefit emergency managers and EOC staff. The next chapter explains those concepts as described in the literature reviewed for this research.

III. LITERATURE REVIEW

This research follows configuration theory in contending that the staff in an EOC will perform more effectively and efficiently if it organizes to match its tasks[27] and task environment. Configuration theory, an extension of structural contingency theory, states that systematic relationships exist between an organization's task environment (e.g., how complex or unstable it is) and its gestalt or configuration of organizational features (e.g., centralization, formalization, and standardization), and that a closer fit between the task environment and structural features results in a greater likelihood of successful performance.

This chapter follows this theory in presenting concepts and relationships of configuration theory to hypothesize how EOC units need to be structured to have higher likelihoods of effectively performing their tasks in the task environments. It discusses the characteristics of environments, features of organizations, and how these features form configurations that explain and predict organizational performance. This provides a foundation in theory and research to identify ways to improve EOC performance and effectiveness.

A. CONFIGURATION THEORY

Organizational theory was defined by Daft as "a macro examination of organizations … concerned with people aggregated into departments and organizations."[28] A branch of organizational theory is structural contingency theory, which argues that fitting organizational characteristics to different contingencies results in higher organizational performance.[29] Configuration theory developed from, and expanded the tenets of, contingency theory.[30] Like contingency theory, configuration

[27] Kenneth W. Thomas and Betty A. Velthouse, "Cognitive Elements of Empowerment: An 'Interpretive' Model of Intrinsic Task Motivation," *Academy of Management Review*, 15, no. 4 (October 1990): 668. Thomas and Velthouse defined a task as "a set of activities directed toward a purpose."

[28] Richard L. Daft, *Organization Theory & Design*, 11th ed. (Mason, OH: South-Western, 2013), 35.

[29] Lex Donaldson, *The Contingency Theory of Organizations* (Thousand Oaks, CA: Sage, 2001), 2.

[30] Donaldson, "The Contingency Theory of Organizational Design," 22.

theory emphasizes the necessity of fit,[31] but it is more inclusive in that "rather than trying to explain how order is designed into the parts of an organization … [it] explain[s] how order emerges from the interaction of those parts as a whole."[32] Henry Mintzberg was a founder of configuration theory and offered the extended configuration hypothesis, which states that, "effective structuring requires a consistency among the design parameters and the contingency factors."[33] This research relied heavily on this premise[34] and the propositions of Mintzberg's theory.

B. THE TASK ENVIRONMENT

Mintzberg and Daft saw the environment as a contingency factor that affects an organization's structural properties; they defined the organizational environment as everything outside of the boundary of the organization.[35] They divided the environment into segments, but not all environmental factors were relevant to this analysis because, as Mintzberg indicated, "It is not the environment per se that counts but the organization's ability to cope with it – to predict it, comprehend it, deal with its diversity, and respond quickly to it."[36] The critical part of the environment, from the perspective of operations, is the task environment. The task environment is everything outside of the organization that *directly* affects the organization.[37] To Mintzberg, it was the milieu in which an organization must respond when designing itself, and he identified dimensions of the task environment that are relevant to this research.[38]

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[31] Christiane Demers, *Organizational Change Theories: A Synthesis* (Thousand Oaks, CA: Sage, 2007), 47.

[32] Meyer, Tsui, and Hinings, "Configurational Approaches to Organizational Analysis," 1178.

[33] Henry Mintzberg, *Structure in Fives: Designing Effective Organizations* (Edgewood Cliffs, NJ: Prentice-Hall, 1983), 122.

[34] The term *design parameters* includes characteristics of individuals and units. The focus of this research is the unit; therefore it uses the term *structural properties* in place of design parameters.

[35] Mintzberg, *Structure in Fives*, 136; Daft, *Organization Theory & Design*, 11th ed., 148.

[36] Mintzberg, *Structure in Fives*, 137.

[37] Daft, *Organization Theory & Design*, 11th ed., 148.

[38] Mintzberg, *Structure in Fives*, 135.

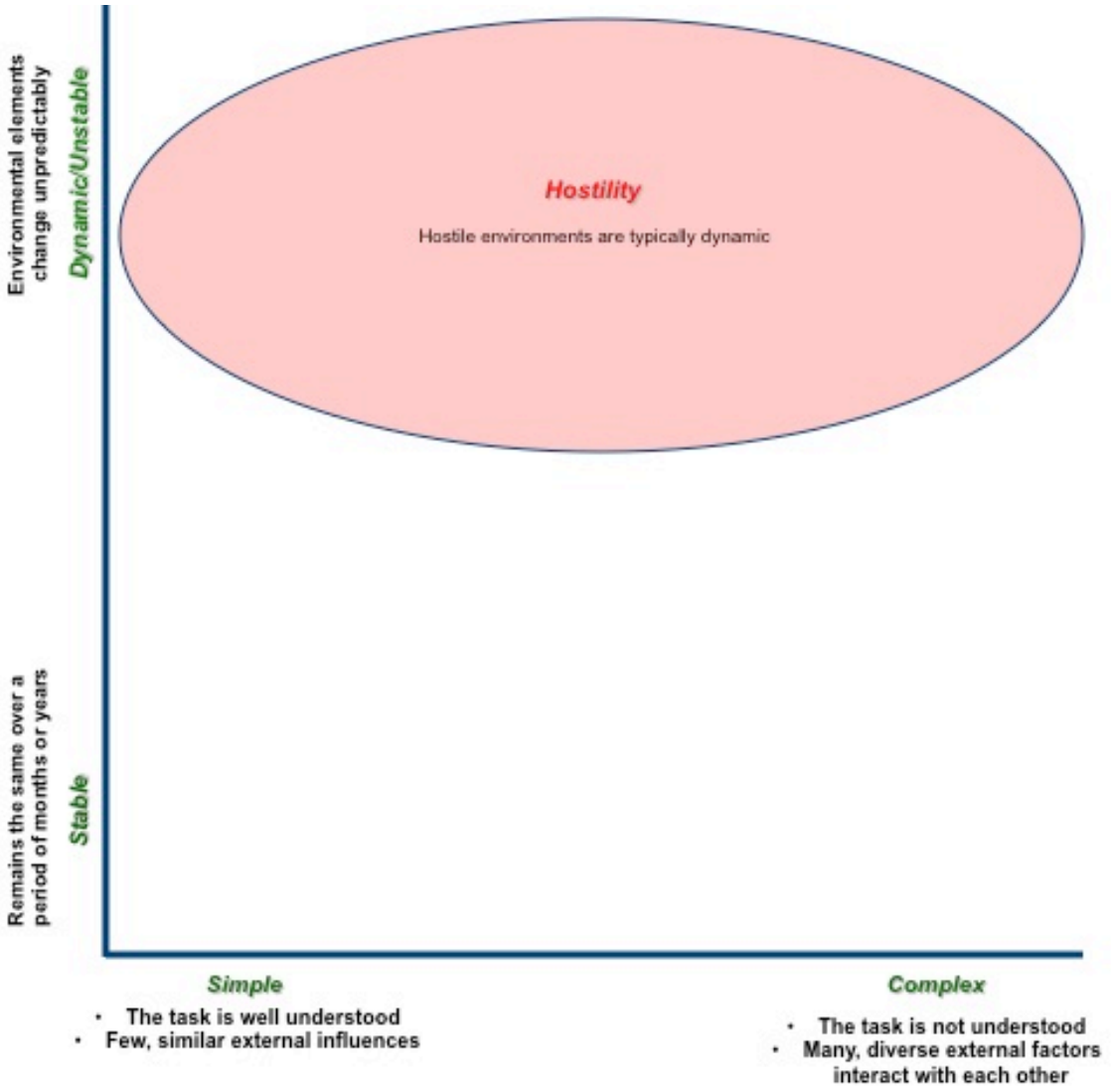
While the environment is key, it represents only one of several contingency factors that affect an organization's configuration. Other contingency factors include the age and size of the organization, its technical system, the experience, knowledge and professionalism of its people, the power relationships within the organization,[39] as well as its goals and strategies.[40] In regard to the present case study, some factors characterize the entire organization and each unit comprising it; for example, each unit shares the overarching mission of the EOC. However, the units have different tasks and task sub-environments, and they vary in size and their implementation of the structural properties described later in the literature review. For example, when tasks and task environments are more complex, then contingency theorists hypothesize that effectiveness is more likely to be achieved by decentralization. When the task environment is more stable and tasks more routine, greater effectiveness is likely to result from more reliance on coordinating through standardized processes and skills.

The idea that there is no one best doctrinal solution to all environments and all problems is developed in the following sections, in terms of task environments that are characterized by dimensions of complexity, instability, and hostility. These are mapped onto Figure 5. That figure shows the horizontal dimension of complexity ranging from simple to complex. The vertical dimension ranges from stable to dynamic or unstable. As the discussion that follows explains, hostility can range in complexity, but typically is indicative of an unstable task environment.

[39] Mintzberg, *Structure in Fives*, 121.

[40] Daft, *Organization Theory & Design*, 11th ed., 17. This research asserts that Daft used the term *culture* very similarly to the way in which Mintzberg used *power*.

Figure 5. Dimensions of Tasks and the Task Environment



Adapted from Henry Mintzberg, *Structure in Fives: Designing Effective Organizations* (Edgewood Cliffs, NJ: Prentice-Hall, 1983).

1. Complexity

The simplicity or complexity of the task environment and tasks can be defined in two ways. One of those is in terms of the levels of knowledge required to do the work. Thus, the amount and variety of knowledge required to complete tasks is commensurate

with the complexity of those tasks.[41] Complexity can also be defined in terms of the number of external influences, including other organizations or stakeholders with which the organization needs to interact and the interdependence of those influences or stakeholders.[42] Both definitions are salient to this research.

Figure 5 shows that the task environment ranges from simple to complex. As discussed later, the organization is more likely to be effective if its configuration is adapted to fit its place on this spectrum. For example, different modes of coordination (e.g., standardized operating processes) are hypothesized to be more appropriate in simple environments versus complex environments; this is discussed further in following sections.

2. Stability

Stable environments can be differentiated from unstable environments in terms of their rates or speed of change and sometimes in terms of the variability of those rates, or what is sometimes referred to as volatility (e.g., stock markets). Daft stated that a stable environment remains unchanged for long or extended periods of time, while an unstable environment is one in which environmental conditions change rapidly.[43] Mintzberg defined an unstable environment as one in which change is unpredictable.[44] This research used both of these definitions. In addition, following Perrow,[45] stable environments can be seen as creating conditions where the work processes of the organization are more likely to be routine.

Figure 5 depicts a spectrum of the task environment that ranges from stable to unstable (also referred to as dynamic). An organization's place on this spectrum affects its configuration. Mintzberg indicated that organizations in stable environments perform

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[41] Daft, *Organization Theory & Design*, 11th ed., 17.

[42] Daft, *Organization Theory & Design*, 11th ed., 153.

[43] Ibid., 154.

[44] Mintzberg, *Structure in Fives*, 136. Mintzberg noted that some change, such as growth in demand, could be predicted.

[45] Charles Perrow, "A Framework for the Comparative Analysis of Organizations," *American Sociological Review*, April 1967, 198–201.

routine tasks that rely on standardized behavior, while dynamic, rapidly changing environments require organizations that use more flexible and less formal structures.[46] Organizations facing crises may be viewed as encountering unpredictable, unstable conditions and novel problems that require varied and non-routine work processes. In the present case study, the organization and its units were working to stabilize a crisis environment.

3. Hostility

The final dimension of the task environment salient to this research is hostility. Hostility is defined as threats to the organization created by a lack of critical resources.[47] For the purposes of this research, time is one such resource. Mintzberg supported this, writing that the speed of necessary responses represents an intermediate variable through which hostility affects organizations and its people.[48]

Hostility directly affects the organization because, as Mintzberg recognized, "hostile environments are typically dynamic [unstable] environments"[49] (see Figure 5). Mintzberg also hypothesized that extreme hostility drives an organization to temporarily centralize its structure.[50] Configurational theory states that effective organizations have structural properties that are appropriate for their environment. The characteristics of organizations well adapted to complex, unstable, and hostile environments will be holistically different from organizations in different environments. The structural properties of units must also fit where they are in the environmental field illustrated in Figure 6. The next section covers specific structural properties or characteristics that make up the configuration.

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[46] Mintzberg, *Structure in Fives*, 138. Mintzberg also emphasized that dynamic conditions have more influence than stable conditions, noting that dynamic environments may move a bureaucracy toward organic behavior but not the opposite.

[47] Ibid., 137.

[48] Ibid.

[49] Ibid.

[50] Ibid., 141.

C. STRUCTURAL PROPERTIES OF THE ORGANIZATION OR ITS UNITS

The way units are grouped and how an organization coordinates its activities are parts of what Mintzberg characterized as the "superstructure" of an organization.[51] This section examines structural properties relevant to this research that compose the superstructure.

1. Unit Grouping and Size

Organizations group individuals and units to enhance coordination, share resources, create a supervisory hierarchy, achieve shared goals, or any combination of those.[52] There are a number of ways to group units; functional grouping is the type of grouping salient to this research. Functional grouping "places together employees who perform similar functions or work processes or who bring similar knowledge and skills to bear."[53] Mintzberg noted that functional structures are typically more bureaucratic,[54] and bureaucracies function better in stable task environments.[55]

Unit size is the number of positions within a group[56] or simply, "the number of employees."[57] Unit size is not the same as span of control, a critical distinction that is relevant to this thesis. Span of control is the number of people reporting to a supervisor.[58] In emergency management doctrine, span of control is "the key to effective and efficient incident management."[59] Mintzberg stated that span of control reflects just one way (direct supervision) to coordinate efforts.[60] He proposed relationships between unit size

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[51] Mintzberg, *Structure in Fives*, 45.

[52] Daft, *Organization Theory & Design*, 11th ed., 108; Mintzberg, *Structure in Fives*, 46–47.

[53] Daft, *Organization Theory & Design*, 11th ed., 108.

[54] Mintzberg, *Structure in Fives*, 59.

[55] Ibid., 144.

[56] Ibid., 65.

[57] Daft, *Organization Theory & Design*, 11th ed., 20.

[58] Mintzberg, *Structure in Fives*, 65; Daft, *Organization Theory & Design*, 11th ed., 18.

[59] DHS, "National Incident Management System," 47. According to the NIMS, the span of control of any individual with incident management supervisory responsibility should range from three to seven subordinates, with five being optimal. During a large-scale law enforcement operation, eight to 10 subordinates may be optimal.

[60] Mintzberg, *Structure in Fives*, 66.

and other ways to coordinate their efforts. For example, he stated that compared with direct supervision, standardized work facilitates larger unit sizes, and a greater reliance on mutual adjustment leads to smaller unit sizes.[61]

2. Achieving Coordination

Coordinating tasks is one of the most fundamental purposes of an organization.[62] The National Incident Management System (NIMS) defines multiagency coordination as "a process by which all levels of government and all disciplines work together more effectively and efficiently."[63] Mintzberg identified four modes of coordination that are salient to the EOC. Each is discussed briefly in the following paragraphs and described to illustrate its relative fit with different task environments that confront the organization or unit. These modes of coordination are "the glue that holds organizations together."[64] Each thus has its appropriate position in Figure 6.

Mutual adjustment is the basic person-to-person communication that occurs between co-workers and colleagues. It is the most informal means of coordination.[65] Direct supervision relies on supervisors to coordinate the efforts of their subordinates. In incident management, direct supervision is often accomplished through the implementation of the doctrinal concepts of span of control[66] and unity of command.[67]

Organizations may use various types of standardization to coordinate their work, including the standardization of work processes and standardization of skills. Emergency

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[61] Mintzberg, *Structure in Fives*, 66–68.

[62] Ibid., 2.

[63] DHS, "National Incident Management System," 64.

[64] Mintzberg, *Structure in Fives*, 4.

[65] Ibid., 7.

[66] DHS, "National Incident Management System," 47. According to the NIMS, the span of control of any individual with incident management supervisory responsibility should range from three to seven subordinates, with five being optimal. During a large-scale law enforcement operation, eight to 10 subordinates may be optimal.

[67] Ibid., 48. Unity of command means that all individuals have a designated supervisor to whom they report, which clarifies reporting relationships and eliminates the confusion caused by multiple, conflicting directives.

management doctrine emphasizes standardization,[68] and in an EOC, the use of a standard operating procedure (SOP) is an example of the standardization of work processes. An EOC's forms are standardized to provide consistent products in the context of a set of standardized procedures. Finally, there is the standardization of skills or knowledge that is achieved by meeting standards of education or training necessary to complete a task; this involves a certification that employees have met standards and can thus meet expected performance standards.[69] Training, like plans, is ingrained in the emergency management culture, and standardizing training is a goal of the NIMS.[70]

Plans are ubiquitous to EOC operations and salient to this research; their place as a distinct coordinating mechanism varied in the literature. James Thompson considered them a distinct method that required less stability and routine than standardized methods of coordinating, making them more suitable for dynamic environments.[71] Mintzberg did not see plans as a distinct coordinating mechanism. He stated that action plans identify desired outputs based on future scenarios; he also considered them a bridge between the standardization of work processes and outputs.[72]

Mintzberg hypothesized a relationship between these mechanisms and the task environment, and Figure 6 maps this relationship. These are not static relationships; Mintzberg advocated flexibility in the use of coordination mechanisms and recognized that organizations, and the units within them, might use any (or all) of the coordination

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[68] DHS, "National Incident Management System," 7. In its "Concepts and Principles" section, the NIMS contains a separate paragraph entitled "Standardization" that states, "Flexibility to manage incidents of any size requires coordination and standardization among emergency management/response personnel and their affiliated organizations. The NIMS provides a set of standardized organizational structures that improve integration and connectivity among jurisdictions and disciplines, starting with a common foundation of preparedness and planning. Personnel and organizations that have adopted the common NIMS framework are able to work together, thereby fostering cohesion among the various organizations involved in all aspects of an incident. NIMS also provides and promotes common terminology, which fosters more effective communication among agencies and organizations responding together to an incident."

[69] Mintzberg, *Structure in Fives*, 6.

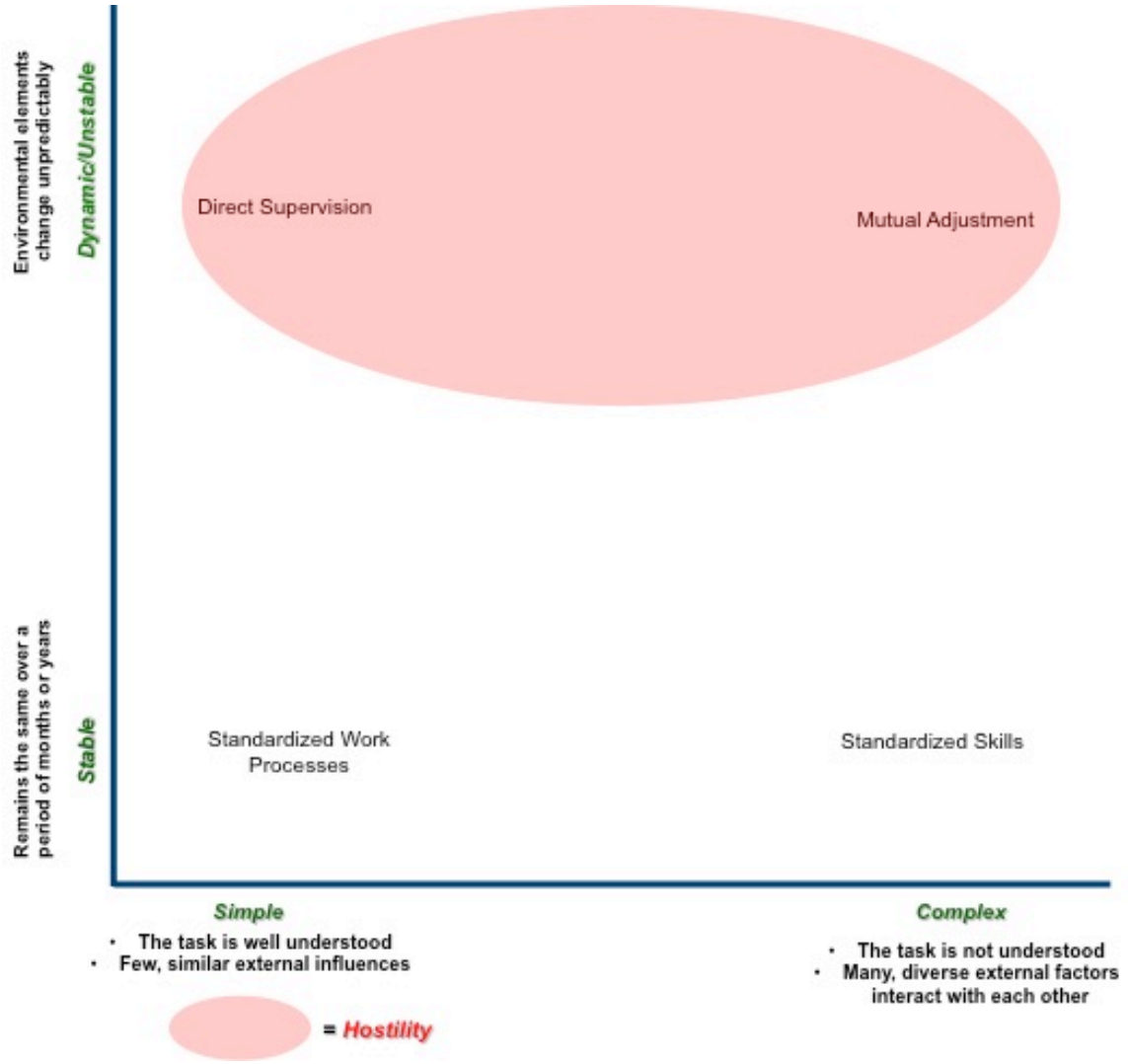
[70] DHS, "National Incident Management System," 20.

[71] James D. Thompson, *Organizations in Action: Social Science Bases of Administrative Theory*, reprint (New Brunswick, NJ: Transaction Publishers, 2003), 56.

[72] Mintzberg, *Structure in Fives*, 73.

mechanisms simultaneously.[73] He did, however, indicate that in general, across situations and time, patterns related to effectiveness result. Thus, this thesis proposes that separate units in an EOC may use different coordination mechanisms to complete their tasks more effectively and efficiently in distinct sub-environments.

Figure 6. Coordination Mechanisms in the Task Environment



Adapted from Henry Mintzberg, *Structure in Fives: Designing Effective Organizations* (Edgewood Cliffs, NJ: Prentice-Hall, 1983).

[73] Mintzberg, *Structure in Fives*, 7.

Mutual adjustment is both the most fundamental means of coordination and the means to which the organization returns to accommodate the need to adapt in the most complex environments.[74] In the most complex and highly interdependent environments, when the use of mutual adjustment becomes mandatory, organizations turn to liaison devices to improve communication and information flows.[75] Liaison structures encourage and help bring order to the informal communications that occur during mutual adjustment.[76] In 1973, Jay Galbraith identified seven such structural devices that he proposed occurred on a continuum that ranged from simple to complex.[77] A decade later, Mintzberg narrowed that list to four types: liaison positions, task forces, integrating managers, and matrix structures.[78] The first three are relevant to this research.

According to Daft and Mintzberg, liaisons actively promote closer contact between two units.[79] The NIMS describes the liaison as a more reactive role, saying that a liaison acts as a "point of contact for representatives of other governmental departments and agencies, NGOs, and/or the private sector (with no jurisdiction or legal authority) to provide input on their organization's policies, resource availability, and other incident-related matters."[80] All three agreed that liaisons fulfill these responsibilities without formal authority. Daft and Mintzberg defined a task force as a group of equals assembled temporarily to address specific problems or issues.[81] Emergency management doctrine defined a task force as a planned or ad hoc assembly of disparate resources gathered to perform a specific response-related mission under the direction of a supervisor with the authority to exercise direct supervision over the task force.[82] The integrating manager is a designated liaison who is delegated formal authority over *decisions* involving multiple

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[74] Mintzberg, *Structure in Fives*, 4.

[75] Ibid., 91.

[76] Ibid., 7.

[77] Jay R. Galbraith, *Designing Complex Organizations* (Reading, MA: Addison-Wesley, 1973), 23.

[78] Mintzberg, *Structure in Fives*, 82.

[79] Daft, *Organization Theory & Design*, 11th ed., 101; Mintzberg, *Structure in Fives*, 82.

[80] DHS, "National Incident Management System," 95.

[81] Daft, *Organization Theory & Design*, 11th ed., 101; Mintzberg, *Structure in Fives*, 83.

[82] DHS, "National Incident Management System," 101.

departments, but not over the *actions* of the other departments' personnel.[83] Daft stated that the person filling this role often comes from an outside department.[84] Like the coordinating mechanisms, organizations implement liaison devices as necessary, and different parts of an organization may turn to different liaison devices to fulfill their needs.

Coordination is both necessary and, especially during disasters, difficult. According to Mintzberg, the need to coordinate is one of two reasons organizations exist,[85] and coordination has long been considered at the center of EOC operations.[86] However, coordination during disasters has historically been extremely challenging;[87] Au contended that poor coordination represents a primary reason that the response to large-scale disasters goes poorly.[88] This may be the result of mismatches between organizational design and the environment.

3. Decentralization

The delegation of formal power to make choices and decisions defines decentralization.[89] During disasters, elected leaders may "decentralize" their authority in a formal manner through a Delegation of Authority.[90] Mintzberg indicated that in some organizations decentralization occurred selectively, meaning that it happened "where the

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[83] Mintzberg, *Structure in Fives*, 83.

[84] Daft, *Organization Theory & Design*, 11th ed., 102.

[85] Mintzberg, *Structure in Fives*, 2. The need to divide labor into various tasks was Mintzberg's other reason.

[86] Ronald W. Perry, "The Structure and Function of Community Emergency Operations Centres," *Disaster Prevention and Management*, 1995, 39.

[87] Louise K. Comfort and Naim Kapucu, "Inter-Organizational Coordination in Extreme Events: The World Trade Center Attacks, September 11, 2001," *Natural Hazards* 39 (2006): 309; David A. McEntire, "Coordinating Multi-Organizational Responses to Disaster: Lessons from the March 28, 2000, Fort Worth Tornado," *Disaster Prevention and Management* 4, no. 5 (2002): 369.

[88] T. Andrew Au, "Analysis of Command and Control Networks on Black Saturday," *The Australian Journal of Emergency Management* 26, no. 3 (July 2011): 21.

[89] Daft, *Organization Theory & Design*, 11th ed., 97; Mintzberg, *Structure in Fives*, 99.

[90] DHS, "National Incident Management System," 138. A Delegation of Authority delegates authority and assigns responsibility from an agency's executive to incident managers.

information concerning the decisions … [can] be accumulated most effectively."[91] He also recognized a relationship between selective decentralization and other aspects of the organizations; specifically, he saw that selective decentralization was associated with functional groups and relied on mutual adjustment and liaison devices to coordinate the efforts of those groups.[92]

There are three additional characteristics of decentralization that are relevant to this research. The first is that a need for subject matter expertise blurs the line between formal decision-making authority and the power to advise.[93] An example is when managers rely so heavily on subject-matter experts that making decisions becomes a shared responsibility. Second, the greater the complexity of the environment, the more decentralized the organization's structure.[94] This allows the organization to segment the complex environment, with each decentralized unit having control over parts of the task environment. Last, extreme hostility pushes organizations to temporarily centralize their structure so that they may react more quickly.[95] When extreme hostility occurs in otherwise complex environments, the organization must balance the need to decentralize to better understand the environment with the need to respond to the threat.[96]

D. ORGANIZATIONAL CONFIGURATIONS

An organization's configuration comprises its structural properties and mechanisms used to organize and coordinate its tasks and effectively adapt it to its task environment.[97] Structure creates formal reporting relationships; places individuals into teams and teams into departments; and establishes systems by which to communicate, coordinate, and integrate across the structure.[98] Configuration meshes the elements of

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[91] Mintzberg, *Structure in Fives*, 102.

[92] Ibid.

[93] Ibid., 109.

[94] Ibid., 138.

[95] Ibid., 141.

[96] Ibid., 142.

[97] Ibid., 151.

[98] Richard L. Daft, *Organization Design and Theory*, 8th ed. (Mason, OH: South-Western, 2004), 90.

these together into "natural clusters."[99] Mintzberg described five configurations: Simple Structure, Machine Bureaucracy, Professional Bureaucracy, Divisionalized Form, and Adhocracy. This section describes four of those configurations, omitting the Divisionalized Form because of its focus on markets and market diversity.[100] These four configurations and their characteristics are portrayed in Figure 7.

A small organization led by, and heavily reliant upon, a single leader exemplifies the Simple Structure. The Simple Structure is a best fit for task environments that are simple and unstable and where the work is routine.[101] Its leader coordinates activities using direct supervision and maintains centralized decision-making power. That centralization, along with the Simple Structure's lack of bureaucracy, makes it flexible and responsive to hostile environments.[102] The simple structure is the football team, its leader the quarterback.

The assembly line factory is the stereotypical Machine Bureaucracy. Machine Bureaucracies perform their tasks with consistency and efficiency gained from standardized work processes. This configuration's decisions emanate from an established chain of command, and its favored task environment is simple and stable. This suits the Machine Bureaucracy because its reliance on a standardized process makes it slow to respond to novel situations; it also affords this configuration the opportunity to develop and refine plans and procedures to generate efficiency. Introduce issues not covered by those established procedures, however, and its limited ability to innovatively solve problems risks crippling its performance. In novel situations, a leader may provide direction; thus, when confronting change (including change generated by hostility), the Machine Bureaucracy temporarily reverts to processes more characteristic of the Simple Structure.[103]

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[99] Mintzberg, *Structure in Fives*, 151.

[100] Ibid., 215–52.

[101] Ibid., 159.

[102] Ibid., 158–62.

[103] Ibid., 163–87.

A group of highly trained employees, often considered "professionals," authorized to make decisions based on its expertise characterizes the Professional Bureaucracy. This is academia, in which educators maintain control over their curricula and classrooms and coordinate their activities primarily through decentralized decision-making and the standardization of their skills. The environment that favors this configuration is stable and complex. Mintzberg recommended that this configuration be thought of as a set of "standard programs … that are applied to predetermined situations, called contingencies." When forced out of its expected contingencies, the Professional Bureaucracy struggles to adapt quickly. To confront change outside the structure of its standardized expertise and skill sets, it must become more adhocratic.[104]

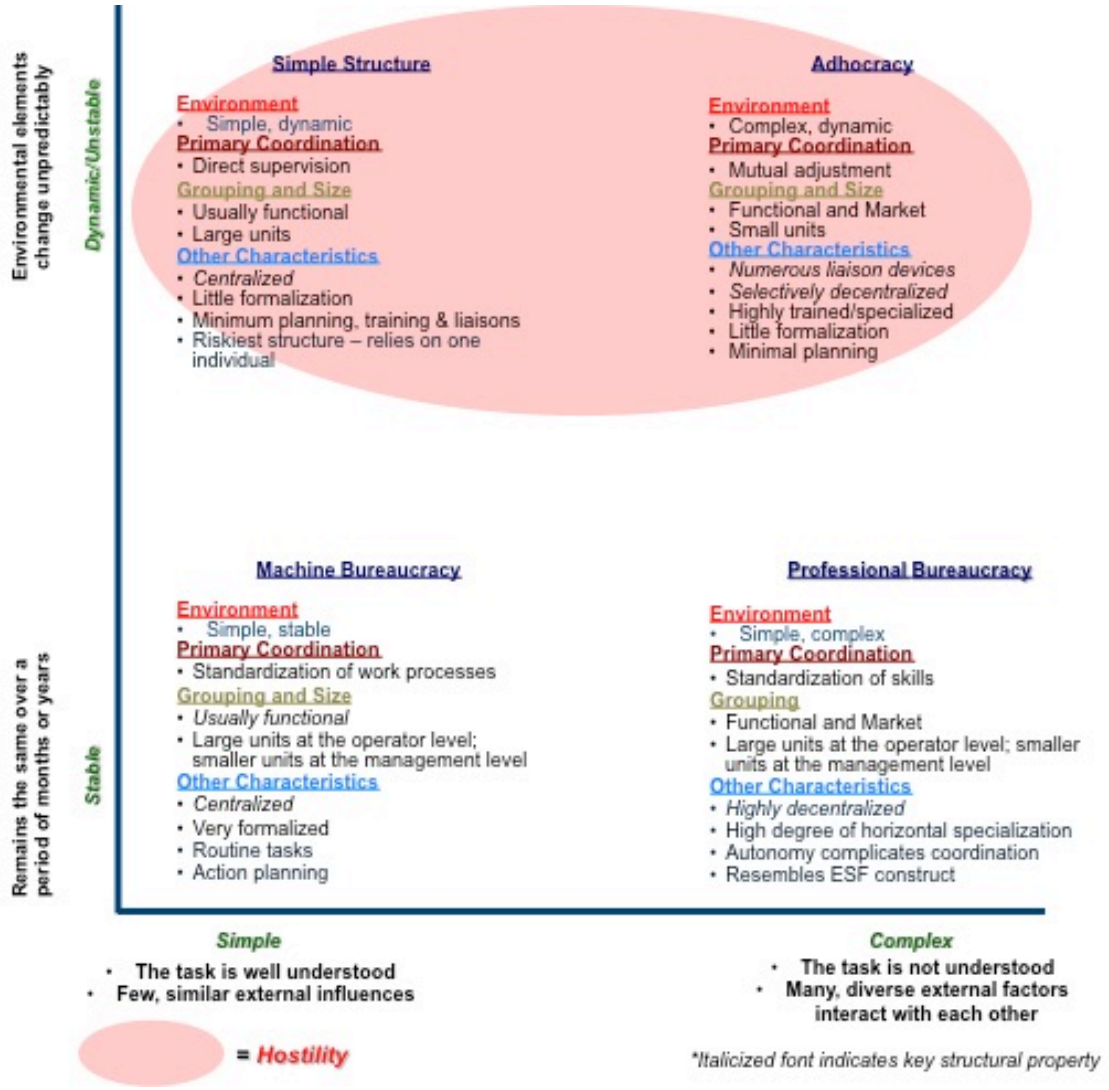
The Adhocracy, like the Professional Bureaucracy, employs highly specialized and trained staff, but it relies on mutual adjustment and liaison devices instead of standardized skills to coordinate its efforts. Those coordinating mechanisms meld with a complex, unstable environment and create a configuration in which professionals focus on innovation without the constraints of bureaucracy. Authority in the adhocracy is decentralized, and this configuration "shows the least reverence for the classical principles of management, especially unity of command." This somewhat free-flowing expertise, operating without a clear chain of command, prioritizes innovation, but does so potentially at the cost of efficiency and time.[105] NASA, DARPA, and Google have all been offered as examples of adhocracies.

Each of these configurations possesses unique characteristics that make them better suited for particular environments. Figure 5 maps the task environment; Figure 7 presents the configurations in the task environments in which configuration theory suggests they will perform best.

[104] Mintzberg, *Structure in Fives*, 189–213.

[105] Ibid., 253–79.

Figure 7. Four Basic Configurations in Their Model Task Environment



Adapted from Henry Mintzberg, *Structure in Fives: Designing Effective Organizations* (Edgewood Cliffs, NJ: Prentice-Hall, 1983).

Daft proposed that few *pure* structures exist in the real world because organizations need the flexibility to respond to ever-changing circumstances.[106] Mintzberg concurred with this, hypothesizing that his configurations become the basis for establishing hybrids.[107] Hybrid organizations possess the characteristics of two or more

[106] Daft, *Organization Theory & Design*, 11th ed., 129.

[107] Mintzberg, *Structure in Fives*, 289.

of the configurations, and Mintzberg noted that the dimensions of the organizational environment generate hybrids. Hostility, for example, drives machine bureaucracies, adhocracies, and professional bureaucracies toward a simple structure, creating the Simple Bureaucracy, Simplest Structure, and Simple Professional Bureaucracy, respectively.[108] Other environmental factors produce hybrids, too. Complexity pushes the Machine Bureaucracy to take on aspects of the Professional Bureaucracy; it also moves the Simple Structure toward Adhocracy. The latter allows for greater input and the use of mutual adjustment for problem solving. A stable environment may also result in the Simple Structure adopting standardized processes associated with a Machine Bureaucracy, where standardized processes replace the need for direct supervision.[109]

A hybrid mentioned by Mintzberg that is particularly appealing to EOCs is one that implements different configurations in its different parts.[110] This hybrid offers the possibility for units within the overall construct of the EOC to configure themselves distinctly to address diverse tasks.

E. ORGANIZATIONAL PERFORMANCE

Performance is here defined in terms of effectiveness and efficiency. Daft defined effectiveness as the extent to which an organization achieves its goals[111] and efficiency by the amount of resources the organization expends to meet its goals.[112] Thus, a high-performing organization is one that achieves its goals with minimal waste and using the fewest resources.

F. SUMMARY

The basic constructs of configurational theory have been presented, and the patterned relationships making up four organizational configurations—Simple Structure, Machine Bureaucracy, Professional Bureaucracy and Adhocracy—have been described.

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[108] Mintzberg, *Structure in Fives*, 286–87.

[109] Ibid.

[110] Ibid., 290.

[111] Daft, *Organization Theory & Design*, 11th ed., 71.

[112] Ibid., 23.

Each of these has been seen to have a favored task environment and can be characterized by specific, dominant modes of coordination appropriate for its different tasks and task environments. Centralization or decentralization become appropriate for different environmental pressures and tasks, and organizations become hybrids of these pure types as they engage changing environmental pressures (e.g., a crisis involving time pressures and a hostile, unstable task environment).

Figure 7 illustrates a set of specific hypothesized relationships that are tested in this case. The overarching hypothesis is that EOC staff will perform better if it organizes its superstructure and structural properties to match its tasks and the task environment. This idea of "fit" follows structural contingency theory and, by extension, configuration theory. It forms the basis for the analysis of nine interviews conducted with responders to the SR 530 flooding and mudslides incident. The next chapter describes the research method.

IV. RESEARCH METHOD

This thesis used configuration theory to examine how the task environments and structural properties of three workgroups in an EOC impacted their performance; each workgroup's configuration was also described. It used a single case study with embedded units of analysis as the research design by which to examine the SCEOC's response to the 2014 SR 530 flooding and mudslides incident. The response to that incident provided an ideal research focus because it created a milieu in which multiple groups performed separate tasks in distinct environments within the overarching EOC organization. The selected workgroups were analyzed individually and compared with each other.

This chapter describes how the author conducted nine interviews—three from each of the three workgroups selected—and analyzed the qualitative data obtained from those interviews. For transparency, the author highlights his role as a participant–observer who managed the SCEOC for a significant portion of the time it was activated in response to the SR 530 incident. That experience afforded unique insights into the gathering and analysis of the data; however, to avoid creating biases, the author only interjected his perceptions into the interviews when, because of their acknowledgement of his understanding of the situation, the respondents left gaps in their answers that needed further clarification. The author also used his first-hand experience to clarify the context within which participants reported their perceptions.

A. THE INTERVIEWS

This research hypothesizes that using the principles of configuration theory would benefit an EOC staff; thus, aspects of configuration theory that appeared during the SR 530 response were the topics of the interviews. Rubin and Rubin stated that, "the goal of topical interviews is to work out a coherent explanation by piecing together what different people have said, while recognizing that each person might have his or her own construction of events."[113] The author developed coherent descriptions of three groups'

[113] Herbert J. Rubin and Irene S. Rubin, *Qualitative Hearing: The Art of Hearing Data*, 2nd ed. (Thousand Oaks, CA: Sage, 2005), 11.

task environments, structural properties, and configurations by interviewing three members from each workgroup.

1. Participants

The intent of this research was to focus on the local-level EOC, so the desired interview subjects were individuals who worked at the local level of government. The Paperwork Reduction Act places limitations on the number of non-federal personnel the author could solicit; therefore, the number of interview subjects was limited to nine.[114] In order to have units to compare and achieve the benefits of a cross-case analysis, those nine were divided into three interviews from three teams. Those teams were the SCEOC Logistics Section, the SR 530 Task Force, and the Human Services Multiagency Task Force. During the disaster response, those groups were responsible for processing the resource orders, planning for clearing the debris from SR 530, and providing human service support to the survivors, respectively.

These groups were selected primarily because they performed distinct tasks on different timelines, in what were assumed to be different task environments, and the author was aware that the groups organized differently. Thus, the author anticipated that the groups implemented different configurations. Consideration was also placed on the disparity in the frequency with which each of these tasks are typically performed by an EOC, which implied personnel with differing levels of previous experience working together as a group and as individuals. All of Snohomish County's previous EOC activations involved a logistics section. Several activations had involved the need for debris clearing, albeit on a much more limited scale, and a few had involved delivering human service support, but never on the magnitude of this incident. These differences

[114] Because the Naval Postgraduate School is a federal institution, information sought from civilians in non-federal agencies are subject to requirements specified in the Paperwork Reduction Act (PRA). The PRA requires an extensive, lengthy, time-consuming approval process through the Office of Management and Budget (OMB) if information is requested from more than 10 individuals. Therefore, the number of interviewees for this project was restricted to nine individuals, which may represent a threat to validity. It is partly for this reason that the perceptions and judgments of the author as subject-matter expert regarding facts of the case and assessments of organizational and environmental variables were especially important to the thesis. Information about the PRA and information collection can be found at a comprehensive website maintained by the U.S. Department of Health and Human Services. It can be found at http://www.hhs.gov/ocio/policy/collection/.

presented the opportunity to analyze distinct organizational design characteristics that evolved in different units responding to the same incident.

With the groups chosen, the author solicited input from the person managing the EOC at the time these workgroups formed. That person was asked to name the one individual in each group who had the most significant influence on the team and who met two criteria: The person had to work at the local level, in either government or their agency, and had to have participated with the group for at least one week. At the end of their respective interviews, each of those individuals was asked to name a candidate with the same qualifiers, and that person became a participant in the second round of interviews. Using the same process with the second participants produced the final round of participants. This method removed the author's input and potential bias from the selection process.

Each of the interview subjects has extensive experience in his or her field and is extremely well respected in the region. Two men and one woman, seasoned emergency managers who all had performed logistics during previous disasters and received extensive training on disaster logistics, represented the Logistics Section. Likewise, two men and one woman represented the SR 530 Task Force. They had different levels of familiarity with Snohomish County's Disaster Debris Management Plan, and all had been involved in varying degrees with previous debris-clearing activities. All were part of the SR 530 Task Force from its inception until its work was completed. Three women represented the Human Services Multiagency Task Force. Two were long-time human service providers working in the public sector, while the third worked for a well-known non-profit provider of human service support to disaster victims. These nine individuals provided the qualitative data for this research. The next section describes how that data was gathered.

2. Interview Process

The author conducted nine semi-structured interviews.[115] These interviews were considered semi-structured because although each individual was asked a set of structured questions (prescribed by the interview protocol found in the Appendix), not all were asked the same follow-up probing questions. The questions were designed to elicit responses about the task environment, the structural properties of the organization, and the group's configuration and performance; the probes were used only when necessary to clarify a participant's response or to ask the participant to elaborate on a particular statement or point. Figure 8 contains examples of some of the structured and probing questions.

Figure 8. Sample of Structured and Probing Questions

Place an X on of the line below to describe the organizational structure used by your group.

Hierarchy ——— Flat

Structured Questions:
1. Describe your group's structure and why you placed the X where you did.
2. How did the structure affect your group's ability to work with other stakeholders?

Follow-up Probes:
1. How was coordination accomplished?
2. How was authority delegated for group members to coordinate?

Place an X on the line below to show how time criticality affected your group:

Very Little ——— Very Much

Structured Questions:
1. Describe how time affected the group's decision making?
2. Describe how time affected the group's problem solving.

[115] Because this study included human subjects, the author followed NPS's policy and submitted the interview protocol to the NPS Institutional Review Board (IRB). The IRB determined that review and approval were not necessary.

The author asked the interviewees to place an X on the line to start the conversation and, later, to compare this response to their narrative. The number of participants was too small to extrapolate statistically meaningful results, so no quantitative conclusions were drawn from the X markings or the questions that asked the interviewees to gauge their perception of their group's level of disaster-related experience and training. These latter responses provided additional qualitative characteristics of each group.

To help ensure the integrity of their responses and to maintain their confidentiality, the author took numerous steps to protect the anonymity of the participants. The interview protocol specifically stated that their responses "will be used in a way that respects and ensures your privacy and all individual contributions will remain confidential." Each interview took approximately one hour and was conducted in a private setting selected by the interview subject. The interview began with the author reading instructions that reminded the participants that their confidential responses would be used for research. The instructions also advised the interview subjects that their responses were voluntary and that while the interview was being recorded, they could ask for the recorder to be stopped at any time. This was done out of respect to the victims and survivors of the incident and, because the author had firsthand knowledge of the emotional nature of the tasks and work that would be described, the author's sensitivity toward the participants themselves. Two respondents exercised this option during their interviews, but resumed after composing themselves.

The interviews were recorded with the interviewees' permission, and the digital recordings were submitted to a transcriptionist via Sakai (a secure file-sharing portal provided by the Naval Postgraduate School). The transcriptionist returned digital copies of the transcripts via the same portal, and the recordings were destroyed. This was done to help protect the participants' identities.

B. ANALYSIS

Rubin and Rubin provided the structure for the analysis,[116] which began by reviewing the transcripts and creating codes based on concepts from configuration theory. During this phase, the transcripts were coded for concepts, which Rubin and Rubin defined as words or terms, and those concepts were organized into themes, which they defined as summary statements and explanations important to the research.[117] An example of a concept that was coded was a participant's use of the word "complexity." Because an established theory's lens may omit original perceptions,[118] the author considered the concepts within configuration theory's task environment, structural properties, and organizational configurations to be typologies. This allowed discrepancies between the perceptions of the participants and established literature's definitions of configuration theory's concepts to be coded correctly and allowed for the potential emergence of novel concepts.

Once the transcripts were coded, the analysis began by sorting the codes. The author created separate documents for each workgroup that placed the codes from each interview side-by-side under the following three categories of themes:

- Factors that influenced the task environment
- Structural properties that appeared
- Attributes and/or characteristics that impacted performance

The side-by-side view allowed the author to compare and weigh the three perspectives. Rubin and Rubin stated that, "in topical studies, you compare and weigh contrasting descriptions of events to work out your own interpretation of what happened."[119] In this research, the comparison and weighing of the concepts was based primarily on prevalence (if two of the three participants held the same view) and how emphatically the concept was communicated. For example, additional consideration was given to one

[116] In this construct, the first phase of the analysis is preparing the data. The second phase involves the analysis of the coded data and building the narrative description of the case study. Rubin and Rubin, *Qualitative Hearing*, 201.

[117] Ibid., 207.

[118] Ibid., 209.

[119] Rubin and Rubin, *Qualitative Hearing*, 224.

interviewee's perspective if that person repeatedly mentioned, or extensively expounded on, the same topic.

After the analysis of the individual workgroups, the author conducted a second analysis to identify concepts that appeared in all of the workgroups. Its purpose was to identify concepts with greater generalized applicability to EOCs. For this analysis, the codes from all of the interviews were sorted using the same three thematic categories. The codes that appeared in all of the workgroups were then summarized.

C. SUMMARY

This thesis hypothesizes that following configuration theory's principle of matching an organization's structure to its task environment offers an opportunity to improve the performance of an EOC's staff. The scale and duration of the SCEOC's response to the SR 530 incident provided a unique opportunity to test this using a single case study design with three embedded units of analysis. Those embedded units were three groups that performed distinct tasks during the response to the case study's incident.

This chapter described how three people from each of those groups were selected and interviewed, and the methods used to analyze their responses. All of the interviewees played integral roles in their respective groups, and they were asked a series of questions during a recorded interview. The author analyzed the transcripts of those interviews using configuration concepts to first identify themes within the individual workgroups, and then themes that appeared in all of the groups. The next chapter presents the results of those analyses and includes a discussion informed by the literature.

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V. RESULTS AND DISCUSSION

This thesis hypothesizes that the use of configuration theory may improve the performance of the staff working in EOCs. The author, a participant–observer, conducted nine interviews with members of three workgroups that formed during the EOC's response to the SR 530 flooding and mudslides incident. The transcripts of those interviews were coded and analyzed using definitions and concepts articulated in literature reviewed. This chapter presents the findings from those interviews.

This is done in two ways. First, separate sections communicate the results from each workgroup. Those findings are categorized within the configurational themes identified in the previous chapter. The findings are followed by a theory-based discussion of each workgroup's configuration. Another section then articulates the cross-case findings and discusses them. Because they appeared in all of the workgroups, these findings are considered more generalized.

A. THE SCEOC LOGISTICS SECTION

The task of the SCEOC Logistics Section was to "receive orders from the field for supplies, equipment, personnel, crews, overhead, aircraft – everything you could possibly imagine – and to fill those orders."[120] Providing such resource support is a fundamental purpose of EOCs,[121] and the SCEOC had performed this function many times in previous exercises and smaller-scale disasters. During those exercises and incidents, the section had closely followed doctrine and training in that it relied heavily on centralized decision-making by the section chief and a standardized procedure to process resource requests. But before the SR 530 incident, the section had not performed its task during the response to a large-scale incident.

[120] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[121] DHS, "National Incident Management System," 66.

1. Factors that Influenced the SCEOC Logistics Section's Task Environment

From the outset, it was difficult for the Logistics Section to understand the scope of its task. "I think for the whole first week people in the EOC were still thinking this was an active rescue,"[122] said one of the interview participants. In fact, all of the rescues had occurred on the day of the incident.[123] The rescue efforts, however, set in motion a large influx of responders whose numbers grew quickly as the rescue efforts transitioned to a search for the victims. At first, the section "did not understand the structure they were supporting," and the "geographic dispersal [of the sites needing support] made it confusing."[124]

The responders began ordering items almost immediately and in unprecedented numbers. Said one of the interviewees, "I have never experienced that volume of resource requests. I have heard other stories of (pauses) yes, people down in Texas, some of the hurricane states, and even from wildfires [experiencing this many resource requests]."[125] And these were not just requests for individual items; some of the resources requested created their own support requirements, which generated additional resource needs. The Type 1 Urban Search and Rescue (US&R) Task Forces[126] were one example of what was described as needing "a pretty long logistical tail and other pieces would have to be put in place to maximize the benefits of those resources."[127]

The SCEOC Logistics Section grew to meet the demand. Assistance came from agencies around the area that sent personnel to augment the section's staff; most were working in the Snohomish County facility for the first time. They were unfamiliar with

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[122] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[123] SR 530 Landslide Commission, *The SR 530 Landslide Commission Final Report* (Olympia, WA: Office of the Governor, December 2014), 1, http://www.governor.wa.gov/sites/default/files/documents/SR530LC_Final_Report.pdf.

[124] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[125] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[126] FEMA, "Urban Search & Rescue Participants," last modified April 23, 2015, http://www.fema.gov/urban-search-rescue-participants. A Type I task force is made up of 70 multi-faceted, cross-trained personnel who serve in six major functional areas that include search, rescue, medical, hazardous materials, logistics, and planning.

[127] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

the technology and the section's structure and procedures, and the personnel changed often. The extended length of the EOC activation meant that there were "a lot of changing faces."[128] Varied lengths of deployments exacerbated the turnover in the section's staff. Some staff members were available "for two or three days [and others] for four or five days."[129] At the same time, there was turnover out in the field. The Logistics Section, located nearly 40 miles from the incident site, was not always clear on the structure of the incident response in the field, and there was "confusion over whether there was one EOC out in the field or an ICP or two ICPs and an IMT or two IMTs. It was confusing and changed a couple of times, especially in the first week, it changed several times."[130]

One effect of all of the changing personnel was a degree of uncertainty regarding with whom to coordinate. There was a sense of "losing some of the connection [of] relationships that started for two or three days and then that person is gone."[131] Another was that incoming personnel were unfamiliar with the situation. "There were a select few who were certain about the job and the task at hand, and knew how to do it," said one of the participants.[132] Another stated plainly that a lot of the work "was being done by a lot of stakeholders who were from outside the organization [who] didn't know the processes of Snohomish County in the EOC."[133] In the field, the personnel were having a similar experience, and the cumulative effect was that "it took a day just to figure out who is who in the zoo and what process [was being used]."[134]

The section could ill afford this delay because underpinning all of the SCEOC Logistics Section's efforts was a sense of urgency expressed by every participant. "Time had a very large impact, very much of an impact [on the section] … It was very critical,"

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[128] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[129] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[130] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[131] Ibid.

[132] Ibid.

[133] Interview Subject, SCEOC Logistics Section, November 21, 2014.

[134] Ibid.

said one.[135] Another added, "Time is definitely an enemy in logistics. There is never enough of it, and time is working against us because everybody wants what they need ASAP."[136] The responders in the field did want, and need, things as quickly as they could get them. Sometimes there were multiple options for filling the requests, and the time constraints resulted in quickly made decisions because of the impression that they "didn't have time to sit around and be real creative."[137] At other times, the uniqueness of some requests affected the section's ability to provide the resources in a timely manner and added to the pressure. For example, the conditions in the field warranted the ordering of dozens of sets of chest waders. The quantity needed overwhelmed the area's supply, which meant that toward the end of the incident, companies on the east coast were filling those orders. In the time it took to locate and obtain those resources, the demand in the field remained unmet and the pressure mounted.

Another issue that the participants felt affected their perception of time was the lack of a standardized process. The next section provides their description of how the group addressed a lack of standardized process and other structural properties that the group implemented.

2. Structural Properties that Appeared in the SCEOC Logistics Section

At the beginning of the response, the Logistics Section organized using "the classical ICS model" with one section chief and three people with functional responsibilities (i.e., ESF representatives) reporting to the chief,[138] but eventually the group expanded to approximately 20 people.[139] They were placed into functional groups based on need (e.g., a fuel group); those smaller groups also helped the section chiefs manage the increased number of people performing the work. One participant stated that with the potential for so many people to be in the resource ordering process, they should

[135] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[136] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[137] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[138] Ibid.

[139] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

have implemented functional grouping sooner.[140] Another added that the section would have benefited from having the ability to expand to accommodate additional functional groupings, while recognizing that the groups needed to be coordinated.[141]

To achieve coordination, the section's staff initially tried to use the pre-established process; in this case, that process was unable to meet the need, and the section struggled to settle on a replacement. They needed a very detailed, multi-step process that documented all facets of the orders "very distinctly"[142] *and* allowed them to interface with the field responders in a way that the section had not previously done while handling the large volume of requests.[143] The former required time that the group did not necessarily have, and there were differing opinions on how best to accomplish the latter, a condition exacerbated by turnover in leadership and personnel. "There was a lack of technical direction from the logistics leadership from the beginning to clearly articulate how a resource request was going to be documented," said one interviewee, along with "very talented individuals that have done logistics. But how they did logistics back home wasn't necessarily the way that … Snohomish County did it."[144] Another respondent added,

> Staff coming in here would get used to kind of working under one system with one logistics section chief and during the first six to eight days where we had all of the turnover … they were all introducing new stuff. I think that took its toll on some of the directors and a couple of the logistics chiefs.

Those leaders characterized the evolving process as a "reinventing of the wheel day after day."[145]

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[140] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[141] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[142] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[143] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[144] Ibid.

[145] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

In the midst of the "ever evolving procedural changes," the section turned to other ways to coordinate its efforts, and the section chiefs assumed a key role in this. They implemented a shift change briefing. It

> was the only way to get the word out to everybody. We would have a huddle and we would have to let the phone ring and we would try to get the word out to everybody at the same time and that was really difficult.[146]

They also tried to ensure that everyone was operating at the requisite level of competence. While many of the people arriving to help were very talented, they did not have the same level of training or experience responding to actual disasters. The section chiefs developed a "pretty good orientation process" and "were very good at bringing those people [with less experience] along."[147] The section chiefs also intervened directly to ensure the functional groups coordinated. "Some orders [required] a little bit of each. So, you can have an equipment order, but you need a driver. So they [the functional groups] have to coordinate and talk. We [the section chiefs] would move them together."[148]

A lack of a common process had other unintended consequences, both good and bad. One participant articulated that in this situation, the section's staff, "needed to have freedom to go beyond [a rigid] process" and further elaborated that,

> If you have a process that says call three vendors and then report, and you are following the process and you call those vendors and they don't have what you want, you can't call in [to the requesting agency] and say, 'Sorry, we can't get that.' You need to be able to move beyond the process.[149]

The others saw benefits as well. One said there was a "freedom to go and talk to each other"[150] that resulted in the sharing of an "incredible wealth of communal

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[146] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[147] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[148] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[149] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[150] Ibid.

knowledge."[151] Another agreed that this was an opportunity to "use your knowledge, skills, and abilities, and your tools and make the best [of the situation]," although the same person felt this sometimes led to people who "worked around the system or they did their own [thing]."[152]

As the incident progressed, a common process did emerge. The group developed standard operating procedures that used a common request form and spreadsheet for tracking resource requests. "We relied on, in the end, a very simple Excel workbook, a Microsoft Excel workbook, which was a nice way to track things and take a complex thing and kind of boil it down," said one interviewee.[153] The group also turned to liaisons, one of whom created a connection between the EOC and the field responders and was mentioned by all three of the respondents. One characterized this position as "the way to go" because "she [the liaison] was positioned at the EOC so she talked every ten minutes with her counterpart in the IMT out in the field."[154] Another shared how having someone from the field helped bring clarity to the EOC about the needs of the field. Later in the incident, a liaison was also sent from the EOC's Logistics Section to the incident command post (ICP), which further helped bridge the two activities. One of the participants filled that role and said,

> I think that liaison role was very important to be able to get up there and explain to the [IMT's] ordering point people what the reality of life was back here [in the EOC] and vice versa. … I think every day kind of helped defuse things so at least relationally you know those groups are still talking. Plus, in the liaison role, being able to de-conflict some of this stuff and being able to provide maybe more timely information to all parties on, well, here is the status of your stuff.[155]

With so many orders, decisions had to be made about priority and need. Decision-making vacillated between the staff and the section chiefs. For some of the lesser issues,

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[151] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[152] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[153] Ibid. .

[154] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[155] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

the staff was "very empowered to make decisions and problem solve on their own."[156] For most of the issues, and because time was so pressing, there was a clear "hierarchy by authority and position power,"[157] in which the section chiefs and their deputies had the final say. According to one respondent,

> As a group we might come up with some ideas for resolving it, but then ultimately it was the deputy and the section chief who had to make the final call for how the final problem was to be resolved.[158]

3. Perceived Impact on the SCEOC Logistics Section's Performance

Most of the respondents' remarks about performance focused on how a lack of process affected the section's efficiency. To one of the interviewees, who stated that with "all of the tools and the training and the technology that we had, there has to be a more efficient way to do that [provide logistical support]," a written process would have meant that "the efficiency of the section would have been light years ahead."[159] Another pointed out that the lack of one process "overcomplicated things and slowed them down;" it also meant that orders were being duplicated, which resulted in people "spending a lot of time trying to vet basically what turned out to be triple (pauses) double or triple orders on things."[160]

A lack of standardized process was not the only thing they identified that degraded performance. Disparate levels of expertise were also cited, as were different levels of experience, both of which were associated with the uniqueness of the situation the section faced. As one put it,

> So even if you had a group who had never done it [logistics], if it is a simple, simple task you are still going to be able to perform it fairly well and be effective. But, the more complex [nature of this incident] coupled

[156] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[157] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[158] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[159] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[160] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

with the lack of certainty or lack of training and experience in that combined makes the performance and effectiveness start to decline.[161]

4. Discussion of the SCEOC Logistics Section's Configuration

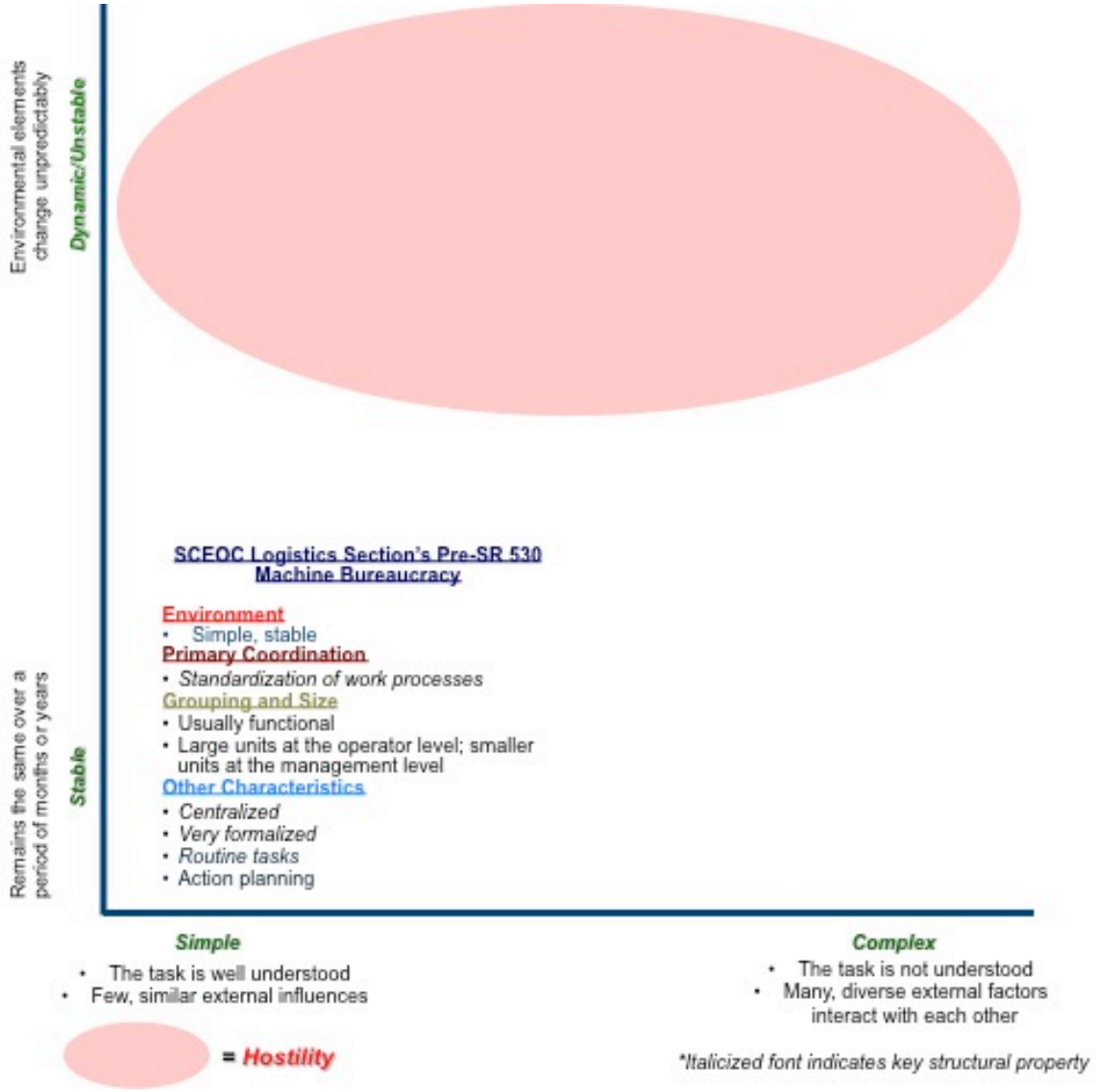
Before the SR 530 incident, the SCEOC Logistics Section exhibited many characteristics of a machine bureaucracy. According to the NIMS, logistics is "the process and procedure for providing resources and other services to support incident management,"[162] and ordering resources should be a standardized process.[163] During previous disasters and exercises, the SCEOC had developed a standardized resource ordering process in which functional groups processed requests that were approved by the section chief, who exercised top-down decision-making authority. Because of the short duration of those activations (prior to the SR 530 incident, the longest previous activation was just a few days), the same people usually staffed the section. The work they performed was routine; the task environment in which they operated was simple and stable. For example, when activated for flooding (the most prevalent cause of activation) the section's personnel procured readily available resources (usually sand and sandbags) for a few partner agencies with which they regularly interacted, and with days of notice. The Logistics Section's reliance on standardized work processes in a simple, stable task environment combined with the use of top-down decision-making reflects a machine bureaucracy's configuration. Figure 9 depicts this.

[161] Interview Subject I, SCEOC Logistics Section, December 15, 2014.

[162] DHS, "National Incident Management System," 142.

[163] Ibid., 37.

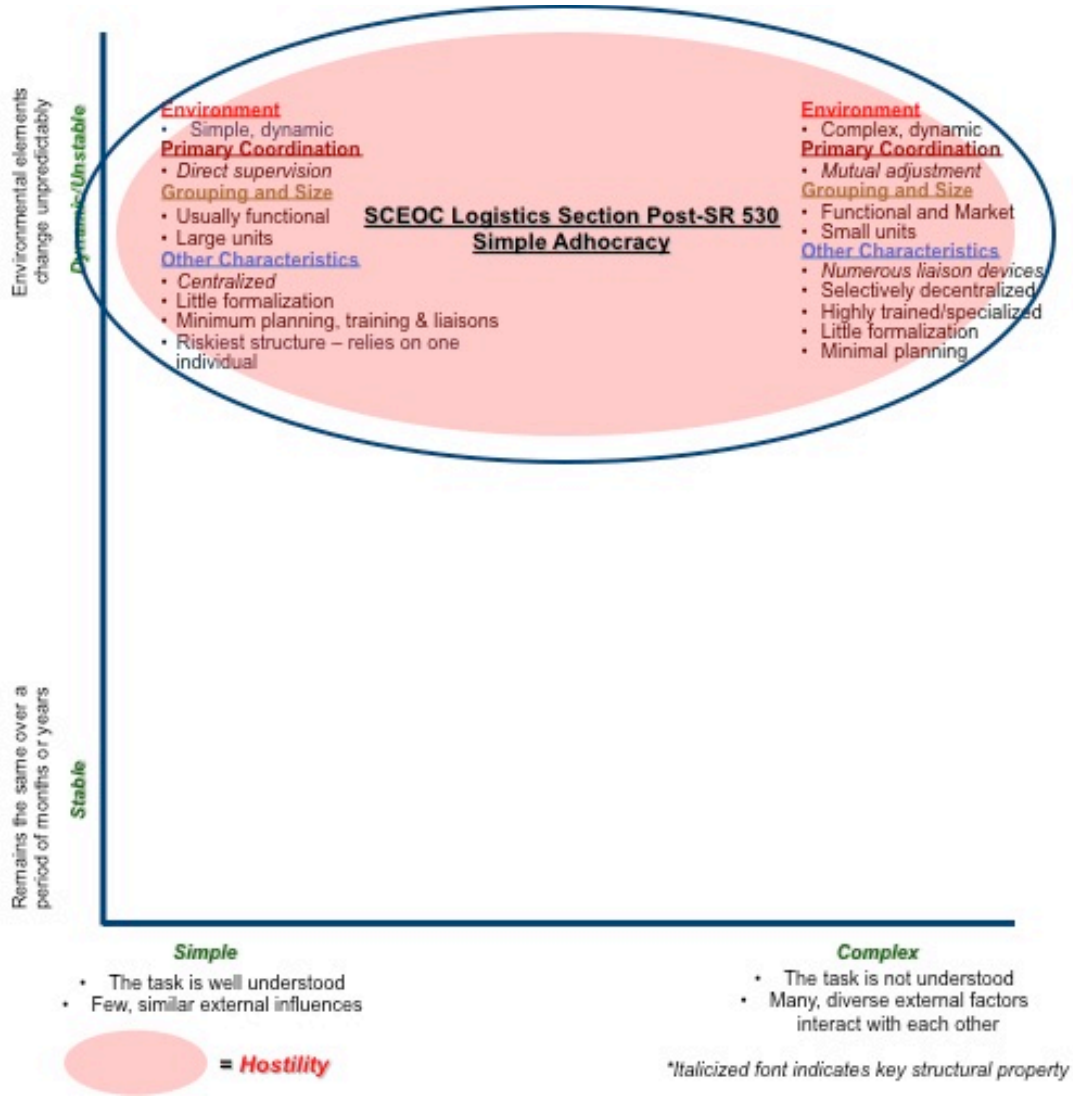
Figure 9. Assumed Configuration of the SCEOC Logistics Section before the Analysis of the Interviews



In response to the task environment it experienced after the case study's incident, and exacerbated by its standardized process becoming overwhelmed, the SCEOC Logistics Section's configuration changed. It assumed a configuration with characteristics

of a Simple Structure and an Adhocracy, a hybrid Mintzberg called the Simplest Structure.[164] This research refers to this as the Simple Adhocracy; Figure 10 depicts it.

Figure 10. SCEOC Logistics Section's Configuration during the SR 530 Incident Based on the Analysis of the Interviews



The Simple Adhocracy offered the flexibility to address the different tensions ("pulls") experienced by the section, one of which was toward adhocracy. Based on the interview responses, the participants from the Logistics Section described a task

[164] Mintzberg, *Structure in Fives*, 286–87.

environment that was complex, unstable, and hostile. In response to that environment, and the inability of the established process to keep up with the demand, the staff organized in small functional groups that exercised a limited amount of decentralized authority and used mutual adjustment to coordinate their efforts. This adhocratic behavior allowed the staff to come up with effective solutions to novel problems.

The second pull was toward the simple structure. Time constraints generated hostility, and as suggested by Mintzberg, that hostility pushed the adhocracy toward the simple structure's configuration.[165] These were not only moments of centralized decision-making; these were instances when the section chiefs intervened directly to coordinate the staff members' activities. Managing the multifunctional orders (such as the one described previously that included a vehicle, fuel, and driver) exemplified the direct supervision exercised by the section chief. The tension between these two conditions existed almost constantly; thus, the Simple Adhocracy formed. The turnover in staff, and subsequent inability to settle on one process, kept them in this configuration until a process, and with it a routine, was reestablished. At that point, the Logistic Section was able to resume operating more like a Machine Bureaucracy.

According to configuration theory, it is not surprising that a strict adherence to standardized work processes would conflict with the initial task environment described in this case because standardized work processes are capable of getting the work done efficiently and reliably where there is stability and little complexity.[166] It is clear from the responses that there was a strong desire for efficiency and less emphasis on the need for effectiveness; however, the latter should not be underestimated. While it was important to get resources to the responders quickly, it was equally important to get them the correct resources. The use of mutual adjustment in the complex, unstable environment may have slowed down the Logistics Section, but it also contributed to problem solving

[165] Mintzberg, *Structure in Fives*, 286–87.

[166] Ibid., 139.

that was "ad hoc" and "evolutionary."[167] From a configuration theorist's perspective, it fits.[168]

This analysis supports the value of configuration theory in an EOC. Emergency management doctrine places a heavy emphasis on the use of standardized processes and protocols for resource ordering.[169] Standardized work processes, mentioned so often as a missing component and often perceived as having a negative impact on the organization's performance, are the primary means of coordination in a Machine Bureaucracy, a configuration that would have been a poor fit for the environment in which the section was operating. Had there not been so many agencies involved and had the staffing situation been more consistent (i.e., had it been a simpler and more stable environment), perhaps a Machine Bureaucracy could have worked. More specifically for this section, an earlier recognition of the task environment might have reduced the concerns about the lack of a standard work process. The section chiefs might have recognized the benefit of using mutual adjustment and liaisons to develop creative solutions and a shared understanding between the EOC and the field, respectively. The latter may have mitigated the perception of time constraints. Recognition of the unique aspects of this task environment may have also led to the establishment of a set duration for how long someone was assigned to the section and the earlier projection of staffing needs. This could have ensured that outside agencies had more time to determine their ability to provide augmenting staff who may have stabilized the organizational environment.

Disaster logistics rely heavily on standardized processes, something ingrained in emergency management logisticians through doctrine and training. During the initial stages of the response to the incident, the standardized process in place, despite having worked well during previous incidents and exercises, proved insufficient. Using configuration theory to analyze the interviews revealed a task environment in which the use of standardized processes was not the best fit; it also showed ways in which the

[167] Interview Subject H, SCEOC Logistics Section, November 21, 2014.

[168] Mintzberg, *Structure in Fives*, 139.

[169] DHS, "National Incident Management System," 37.

section's structure adapted to the task environment. These adaptations helped the section to perform its task effectively until a routine environment could be reestablished.

Finally, an understanding of configuration theory and of the factors that influenced the task environment could have offered opportunities for the section's leaders to mitigate the effects of the task environment on the section. While they could not influence the number of agencies with whom they needed to interact, they could have instituted stronger parameters on participation that would have brought greater stability to the section.

B. THE SR 530 TASK FORCE

The mission of the SR 530 Task Force was "to open SR 530."[170] Composed of a number of subject-matter experts, the SR 530 Task Force quickly assembled in the aftermath of the incident to plan how to accomplish that mission. It had never worked on an incident of this scale, but the SR 530 Task Force did have the benefit of Snohomish County's Disaster Debris Management Plan (DDMP), the tenets of which Snohomish County had implemented on a much smaller scale during previous disasters. Although the literature reviewed for this research does not agree on the applicability of a plan as a coordinating mechanism, the DDMP offered a starting point for the group's efforts.

1. Factors that Influenced the SR 530 Task Force's Task Environment

From the outset, the representatives of the SR 530 Task Force realized that accomplishing their task would entail working with numerous, diverse agencies. "It [the debris management task] involved a lot of other agencies to assist us from the state and federal level, local [level], and again the private property owners," said one interviewee.[171] Not only were all levels of government represented, but there was also a diversity of functions. Another said,

> We had the chief of counsel; we had state PA [Public Assistance]; we had the U.S. Army Corps of Engineers, both the green suit and the white

[170] Interview Subject C, SR 530 Task Force, December 18, 2014.

[171] Interview Subject A, SR 530 Task Force, November 13, 2014.

> shirts; we had surface water; we had solid waste; we had road maintenance; we had WSDOT [Washington State Department of Transportation], both their construction and procurement people; we had Snohomish County environmental; we had engineering services.[172]

There were so many agencies working on the issue that one of the participants found that, "the complexity initially involved getting the right people to the table."[173]

Yet, even with so many agencies sending representatives, none of those people understood the task because none of them had ever attempted to do what they had been tasked to do, which was to address the convolution of personal effects, remains, buildings, and woody debris generated by the slide.[174] Even the solicited outside expertise was of minimal assistance. "When FEMA came in, they said, 'Yes, we do tornadoes and hurricanes and all of this. We have not done this on the scale that you have, what you are facing,'" recounted one interviewee; this "stopped the group dead in its tracks."[175] The county's debris management plan helped get it moving again, but "it [the plan] didn't address a number of things just because we had never encountered anything like this," said one respondent.[176] "It wasn't as if it were an earthquake and a building fell down," said another.[177] This was a novel situation for the group.

It was also one that required the group to synchronize its work across several concurrent efforts. Sometimes those concurrent efforts were obvious, and sometimes they were not; all had potential impacts on the SR 530 Task Force. For example, it was straightforward that victims were still being found and identified, and that meant that "working with the medical examiner was fairly dynamic because we were doing this planning while they were still actually kind of in recovery."[178] At the same time, the group was less clear on other decisions. One recalled wondering, "if we are going in this

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[172] Interview Subject C, SR 530 Task Force, December 18, 2014.

[173] Ibid.

[174] Interview Subject A, SR 530 Task Force, November 13, 2014.

[175] Interview Subject B, SR 530 Task Force, November 21, 2014.

[176] Interview Subject C, SR 530 Task Force, December 18, 2014.

[177] Interview Subject A, SR 530 Task Force, November 13, 2014.

[178] Interview Subject B, SR 530 Task Force, November 21, 2014.

direction [with the debris removal planning] and thinking that a dike is going to go in, but [then if] it's not going to go in, how does that impact our operation?"[179] The physical conditions on the ground also changed rapidly, in large part because of the weather. "Once it rained on it [the debris field], it immediately turned into a difficult if not almost impossible place to work;" this posed a significant problem, as the task force was intent on "getting in and getting out throughout the rainy season."[180] The threat of weather constantly and unpredictably threatened to disrupt the timeline, and time was the primary motivator for the SR 530 Task Force.

The desire to get the road open quickly was palpable. "The overriding timeline was, well, open the road yesterday," so "the time criticality was really driving the group," said one participant.[181] The task force wanted to restore access to Darrington and the affected area east of the slide; it also had to comply with policies that required the task force to complete its work within specific time frames. Said one participant, "the big concern that we had was the window of opportunity, meaning when we were given time from FEMA for notice of award for the contract to getting it done before the rainy season." That window of opportunity was weeks, not the minutes or hours often associated with disaster response. But for the work they were trying to accomplish, "A month sounds like a pretty long time, but in reality a month was not much."[182] Another participant agreed, stating, "We did some pretty amazing work in a very short amount of time. People worked some significant hours. There were some of us that worked 20 hours a day."[183]

Those 20-hour days were indicative of how impactful time was on the workgroup; its influence pervaded the group's activities. The number of participating agencies working together and the lack of previous experience in performing this type of debris clearing also affected the task environment; that task environment helped shape the

[179] Interview Subject A, SR 530 Task Force, November 13, 2014.

[180] Interview Subject A, SR 530 Task Force, November 13, 2014.

[181] Interview Subject B, SR 530 Task Force, November 21, 2014.

[182] Ibid.

[183] Interview Subject C, SR 530 Task Force, December 18, 2014.

workgroup's structure. The next section describes the SR 530 Task Force's structural properties.

2. Structural Properties that Appeared in the SR 530 Task Force

The SR 530 Task Force's size ranged from 20 to 40;[184] at times the meetings were "standing room only."[185] The Task Force formed smaller workgroups based on need. "If water was an issue, which it clearly was, there was a water group. If the disposal of materials was an issue, there was a disposal group," shared one of the interview subjects, who added that the participants were allowed to "self-select into their area of expertise."[186]

All three interviewees highlighted the high level of expertise within the group.[187] "Just in terms of people that came to the table, [they] were expert in their field so they were very capable," was one's characterization.[188] The interviews also articulated the freedom with which those experts interacted. Two of the three interviewees considered them a group of equals,[189] and the third said that, "Everybody had a voice."[190] The expertise and ability to work together freely was important in a situation where "we need someone who can help us creatively solve the problem and not just pull out the rulebook that says you need to do X, Y, and Z."[191] With the ability to interact as they did, the members of the SR 530 Task Force did a "lot of bouncing wild ideas off of each other."[192] It was an atmosphere in which "no one's idea was [considered] ridiculous, so that we could at least take what they [the various members of the group] were saying and

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[184] Interview Subject B, SR 530 Task Force, November 21, 2014.

[185] Interview Subject A, SR 530 Task Force, November 13, 2014.

[186] Ibid.

[187] Ibid.; Interview Subject B, SR 530 Task Force, November 21, 2014; Interview Subject C, SR 530 Task Force, December 18, 2014.

[188] Interview Subject A, SR 530 Task Force, November 13, 2014.

[189] Interview Subject B, SR 530 Task Force, November 21, 2014; Interview Subject C, SR 530 Task Force, December 18, 2014.

[190] Interview Subject C, SR 530 Task Force, December 18, 2014.

[191] Interview Subject A, SR 530 Task Force, November 13, 2014.

[192] Interview Subject B, SR 530 Task Force, November 21, 2014.

maybe add it as an alternative."[193] The group's members were also free to solicit input and assistance from agencies outside of the group.[194]

To orchestrate the group's efforts, one agency provided an individual who "helped to facilitate meetings and directed meetings; took notes in meetings; [and] helped to define certain roles and responsibilities."[195] That position exercised some authority, but it was not formally designated as the leader. Rather, this facilitator's job was to "rein the larger group in just to keep them on task and on focus. But, there wasn't a real org chart or anything to it. It [the organization] was flat all the way across."[196] Still, one of the interviewees recalled that this person had enough authority to manage the number of participants. According to one participant, the person "threw out four different debris contractors" and was able to "pare FEMA down to three or four key representatives and [limit] each department in Snohomish County;" other agency participants were "invited to go and do other work."[197]

Regarding overall authority, there were disparate perspectives. On one hand, "everybody at the table were [sic] there because [their] superiors had authorized them to do what was necessary."[198] In the time-constrained environment, however, the need to move past discussions and on to the next decision resulted in one agency, or even one person, making the final call. The input of the task force members was valuable, but "I think you tend to beat it [the potential solution] to death too much," said one.[199] The answer to that was, according to another, "at some point in time I just had to say okay, we are done. We have to make a decision to keep moving things forward."[200] When it came to those decisions, a single decision-maker decided.

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[193] Interview Subject A, SR 530 Task Force, November 13, 2014.

[194] Ibid.

[195] Ibid.

[196] Interview Subject B, SR 530 Task Force, November 21, 2014.

[197] Interview Subject C, SR 530 Task Force, December 18, 2014.

[198] Ibid.

[199] Interview Subject B, SR 530 Task Force, November 21, 2014.

[200] Interview Subject A, SR 530 Task Force, November 13, 2014.

3. Perceived Impact on the SR 530 Task Force's Performance

The interview subjects expressed differing perspectives of the group's performance. According to one, "We nailed it. … Because we created a space where everybody was equal."[201] The others were less definitive in their assessments. One said, "It was very effective given the circumstances and what we came up with for a solution led to a successful outcome in terms of the project," but that, "I do think if there was a bit more structure and hierarchy it would have (pauses) I don't think it would have been a different outcome. We might have just moved through things even quicker."[202]

The other interview subject echoed this sentiment. To this person, the idea of experts interacting freely ostensibly allowed them to "just brainstorm and go, okay, how can we solve this thing rapidly?' But in reality the ad hoc interactions created duplication of effort and, "The effectiveness of the group was probably difficult because there were so many people from so many different jurisdictions with so many ideas. In a perfect world that would be great, but in an instant decision-making world it's difficult."[203]

4. Discussion of the SR 530 Task Force's Configuration

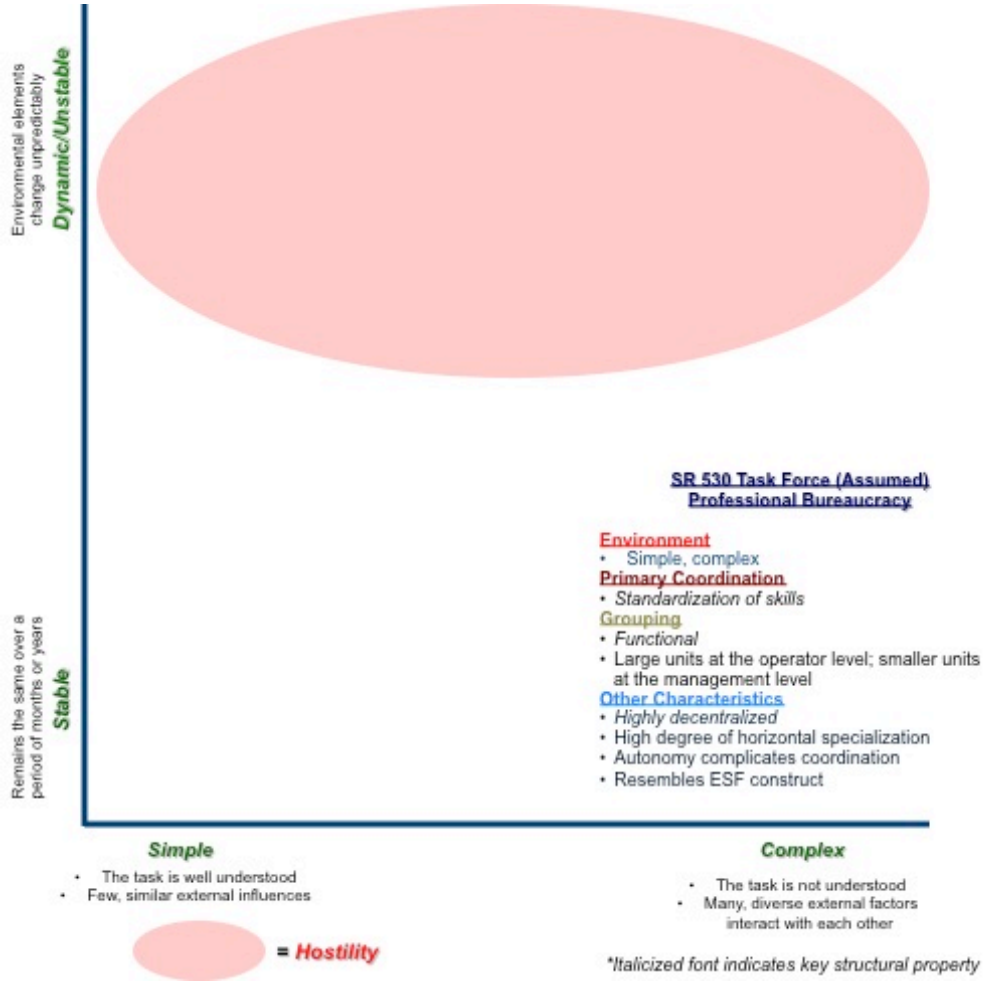
The SR 530 Task Force was tasked with determining how to remove the debris covering SR 530 as quickly as possible while being respectful of the search for remains and personal belongings intermingled with the debris. To accomplish this, a group of specialists assembled. These individuals brought expertise and typically worked within their respective functional area (i.e., area of expertise); they also worked within the rules, policies, and procedures that governed their home agency. At the group's inception, the presence of so many equally skilled professionals working within these established parameters implied that they would form as a Professional Bureaucracy. Figure 11 depicts this configuration.

[201] Interview Subject C, SR 530 Task Force, December 18, 2014.

[202] Interview Subject A, SR 530 Task Force, November 13, 2014.

[203] Interview Subject B, SR 530 Task Force, November 21, 2014.

Figure 11. Assumed Configuration of the SR 530 Task Force before the Analysis of the Interviews



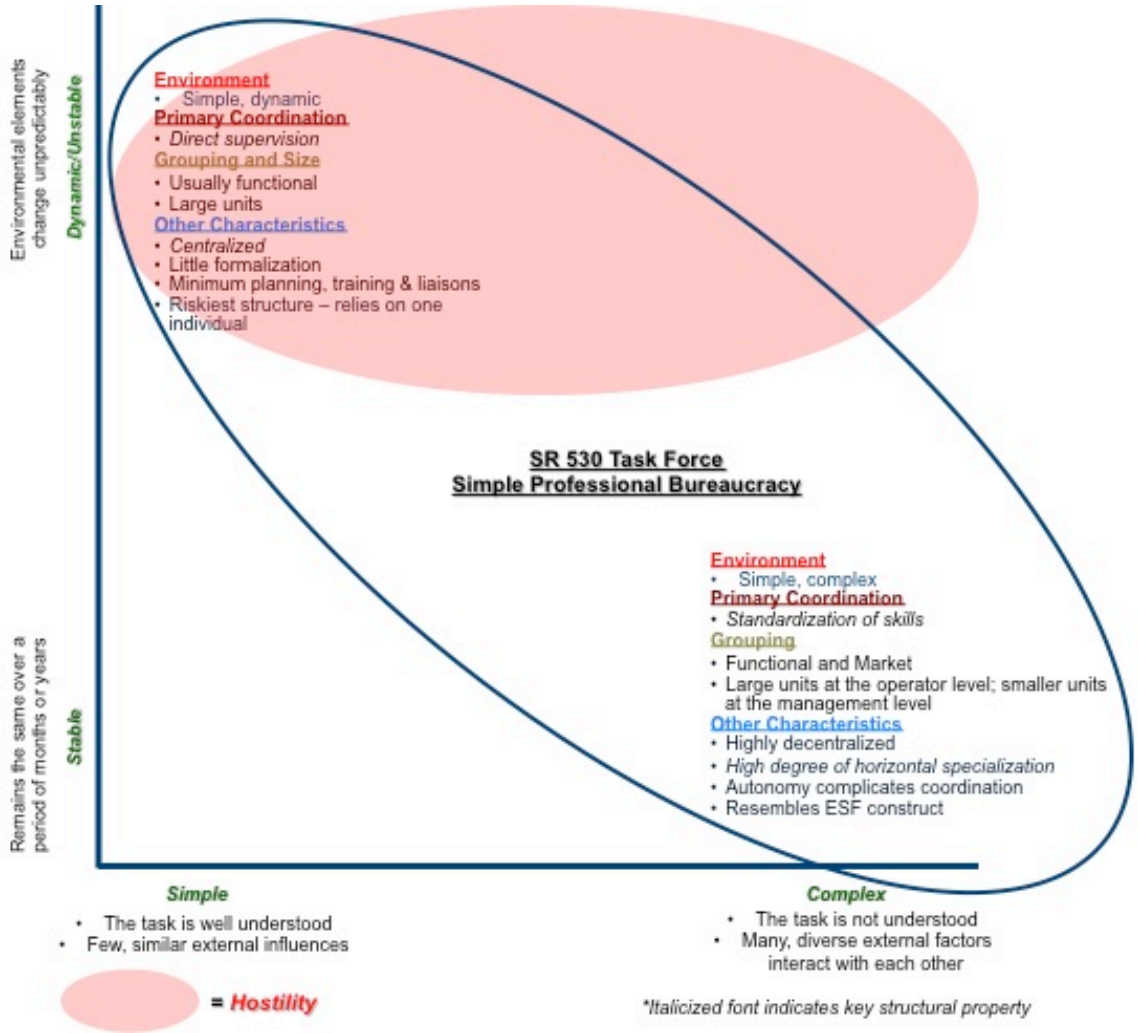
Its task environment, however, placed multiple tensions on the SR 530 Task Force; those tensions changed its configuration. The expertise of the Professional Bureaucracy allowed it the flexibility to address the interdependent and emerging issues it faced.[204] Concurrently, there was a pressing need to perform its work quickly. This pulled the group toward a Simple Structure. These were the instances in which the facilitator ensured that the workgroup's efforts were coordinated, tightly managed the meeting schedule, and even limited the group's membership in order to expedite its work.

[204] Interview Subject, SR 530 Task Force, November 21, 2014; Interview Subject, SR 530 Task Force, December 18, 2014.

Although this person was not empowered per se, this sort of coordination reflects a Simple Structure.

The centralized decision-making described in the interviews also typifies a Simple Structure. Although the smaller groups into which the participants self-selected possessed the decentralized authority to obligate their agency's resources, final decisions came down to one agency. Cumulatively, these pulls resulted in a hybrid configuration Mintzberg called a Simple Professional Bureaucracy (see Figure 12).

Figure 12. SR 530 Task Force's Configuration during the SR 530 Incident Based on the Analysis of the Interviews



Configuration theory not only explains how complexity and significant time constraints influenced the group's configuration and created this hybrid; it also suggests ways to mitigate the task environment. For example, weather's unpredictability is uncontrollable, but closer coordination with the other planning efforts (perhaps through the use of liaisons) might have brought a greater sense of stability to the group. Further, some of the perceived time constraints were artificially created by FEMA's policies governing debris management. A request for (or the provision of) flexibility in those policy deadlines, especially in what was already a complex and unstable task environment, might have relieved some of the hostility created by the time constraints.

Configuration theory also provides insight into the SR 530 Task Force's structural properties. Functionally grouping the experts led to effective results, but there was a perceived lack of efficiency. The account of an individual who possessed the authority to call other agencies' representatives to the table, but did not have the ability to obligate another agency's resources,[205] conforms to Mintzberg's description of an integrating manager. Increasing efficiency may also have been achieved by formally recognizing the authority of the integrating manager. In this case, individuals stepped forward and unknowingly filled many of the responsibilities of an integrating manger. Had they been officially recognized, they might have been able to exert greater influence and move things along more quickly. Integrating managers are not currently found in EOC doctrine or training; this is yet another example of how configuration theory could benefit EOCs.

C. THE HUMAN SERVICES MULTIAGENCY TASK FORCE

The mission of the Human Services Multiagency Task Force was to "organize and orchestrate" human service and mental health support to the survivors.[206] Providing such services to clients is the core function of many of the agencies that became part of the task force. Some of the local agencies had worked together previously, but, as is often the case during large-scale incidents, a number of agencies from outside the area arrived to offer their assistance. Nearly all of these agencies work within specified charters or under

[205] Interview Subject C, SR 530 Task Force, December 18, 2014.

[206] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

specified authorities, which usually results in each individual agency having a limited scope of service.

1. Factors that Influenced the Multiagency Task Force's Task Environment

For some of the agencies, providing their services to the survivors and affected communities meant performing their work in an unfamiliar environment. The local agencies were performing work that they typically performed, but "relative to other human services issues it [the complexity] was quite high," said one of the respondents.[207] "The human services group … had great experience in their base services, but the whole disaster element was new," said another.[208] The third interviewee, who agreed that they were performing their work in an unprecedented environment, attributed it to the context of the situation. According to that person,

> The main thing [is] that for the most part the different aspects were in and of themselves (pauses) each of them was simple enough. The most difficult was probably (pauses) the most difficult was dealing with the fact that it was a mass fatality,

which to the same respondent meant dealing with "the most craziest [sic] complex thing we have done."[209]

The diversity of needs was another factor that influenced the task environment. Before they could even understand exactly what was needed, the Multiagency Task Force had to identify the survivors and their family members, some of whom lived outside of the area.[210] Once they did, there were a "number of things that needed to happen where there were guidelines for what needed to happen and the different areas where these things needed to happen [but] you couldn't use the same solution for all parts of the incident."[211] An example of the latter was the reunification of personal belongings, a

[207] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[208] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

[209] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[210] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[211] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

challenge that entailed "a whole new program that needed to be developed without a template to work from."[212] Feeding and sheltering survivors, ensuring availability of mental health resources, and developing the means to reunite survivors with their personal property comprised just part of the group's work. Ultimately, the task force's mission was to find ways to try to meet the physical, psychological, and financial needs of the people affected by this tragedy.

Dozens of organizations joined the effort to address the needs of the survivors. On one hand, the availability of so many personnel was an asset. "We were able to have a lot of people in and out and … like, we need this body of work done, can you come in and do it?" said one.[213] On the other hand, the multiple organizations created some confusion. They included volunteers and members of non-governmental organizations, state emergency management, and federal emergency management that arrived very quickly. One interviewee said, "You [were] continually having to incorporate new actors at a very fast pace … people were coming in, they are here one day and gone the next."[214] The influx of entities introduced agencies that brought in "people from all over the country," remembered one interviewee, who added that these groups had to learn that they were "playing in the same sand box."[215] The rapidly changing faces and agencies involved concerned one of the participants, who shared that "Any uncertainty [about their ability to complete their task] was, 'How do we get there [get the task completed] in a constantly changing environment?'"[216]

In addition to these factors, time influenced the task environment, and the respondents' recollections of its effect were powerful and poignant. One recalled,

> There wasn't a person out there who wasn't aware that this was a catastrophic event in which there was a tremendous loss of life, and for those that didn't lose their lives that there was (pauses). I mean, in the immediate survivor community there were people who were profoundly

[212] Ibid .

[213] Ibid.

[214] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[215] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[216] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

> affected and traumatized, and that rippled out. Every minute that we were losing with trying to be able to hook in with people was a minute that we were losing to help try to reduce the level of trauma for them.[217]

The desire to address this, especially within a group of professionals dedicated to providing human services, was clearly stated by one respondent. "I think I was here 20 hours the first day and was down to 16 after that, but (pauses) so the first three days were totally crazy."[218] And throughout the course of those long days, things happened quickly. "It was all bam, bam, bam … it was all time driven."[219]

2. Structural Properties that Appeared in the Multiagency Task Force

The task force was created to coordinate the number of agencies involved; one of the interviewees estimated that at times there were 200 people[220] who represented dozens of agencies. One interviewee said,

> The primary way, I guess, in which they [the various entities] became incorporated structurally was through the creation of the multiagency task force. FEMA actually helped us set that up where you sort of looked at all of the various human services functions and services and organized an overarching task force.[221]

One agency was now responsible for providing someone whose job was "facilitating the meetings … you know, running the agenda, but basically everybody in this whole group [was] equal partners."[222] Another described the climate as one in which "Nobody is telling us what to do, we are not telling anybody else what to do. It's more 'we are partners, we are collaborating.' So it [was] very peer to peer."[223]

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[217] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[218] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[219] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

[220] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[221] Ibid.

[222] Ibid.

[223] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

Many of the members of the task force were "career helping professionals" for whom "that kind of process [providing human services] is sort of like breathing."[224] With so many needs to address, from the early stages of the task force's existence, these professionals coalesced into groups focused on determining the best way to address the needs. One respondent described those groups as autonomous "bubbles," saying, "I would check in with them and if they were staying within their bubble, their problems are their problems."[225] Another stated that the groups were "various committees [that] were really like workgroups [within the task force]."[226] The third considered them "circles and spheres of influence."[227] The people within the groups exercised the ability to interact freely. There were "lots of telephone calls, you know quick brief meetings [sic], conference calls, and things like that."[228] More specifically, if individuals needed to talk, they would "pick up the phone and call back and forth and deal with whatever the individual thing was at the time."[229] This was not an expectation of the group's leadership; it was just the way they worked through issues. "This was not a chain of command kind of situation. If you are working on [an issue], you all go off and go over there [and resolve it]," was how one interviewee characterized the situation.[230]

Collectively, the Multiagency Task Force did not rely on pre-established processes. It performed its work in a situation in which "We are not going to be able to apply a single set of simple rules and make us all functional," and as a newly formed group, "We didn't have clear processes that everybody understood," said one of interview subjects.[231] The group attempted to establish processes in a manner described as "totally ad hoc."[232] Meanwhile, the individual agencies had their own policies; this complicated

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[224] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[225] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

[226] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[227] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[228] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[229] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[230] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[231] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[232] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

attempts to create a shared process and occasionally created friction. According to one interviewee,

> Where it broke down was when we were having to establish the new relationships on the fly and they have got their processes and procedures, you have got your processes and procedures, and how are you going to make those mesh? And when they don't mesh, then you are doing the call around and seeing who you can find that has got the authority to, you know, get it together and bull through it.[233]

The diverse processes perpetuated because there was no singular authority ("not a chain of command kind of situation"), so the agencies maintained their respective authorities. Some power was delegated to their representatives, but it was not always clear "at what level of the organization is [a] decision being made" and, "You could spend an hour talking to somebody and think that you have just worked out how to do X and in fact find out that they have no decision making authority whatsoever."[234] When it was clear, the delegated decision-making had benefits. "I was given a phenomenal amount of leeway … I could make whatever decisions I wanted," said one of the interviewees.[235] This allowed the agencies that "have got [sic] the responsibility and the authority" to execute what needed to be done.[236] It also affected the group's performance.

3. Perceived Impact on the Multiagency Task Force's Performance

Within the group were agencies that provided the same services. Without a single authority or established process to assign clients to specific agencies, duplication occurred. Duplicated efforts meant resources were not used as efficiently as they could have been. "In terms of efficiency, there is no question there were redundancies and that there were overlaps."[237] The Multiagency Task Force was good for "doing the kinds of

[233] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[234] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

[235] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

[236] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[237] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

problem solving stuff," but the group needed someone to direct "all of these other folks coming in and saying we are here to help. Fine, here is how you can do it."[238]

Asked how that would change the group's performance, one interviewee said,

> Certainly, first and foremost, the efficiency. Like I say, this (pauses) people wound up being effective, but I think that there were a lot of resources, time being one of the scarcest and unrecoverable one [of those], that were used with trying to get it (pauses) to try to get this to work. If we say that someone's coming, this is where we see that you can fit in. You know what? If you don't want to do this [disaster], great. Go on to the next one because you know that there's a next one. That is actually more efficient and ultimately probably even somewhat more effective than have them running around and being in the community doing their own thing.[239]

In the end, this person found that individual professionalism led to effective outcomes. "Everybody was going to figure out a way in this wildly inefficient environment for how to be effective" and that ultimately the group was "reasonably effective, eventually, through a lot of blood, sweat, and tears."[240]

Another participant concurred that duplication led to inefficiency and that some of the duplication resulted from agencies that were not part of the task force operating in the communities. In this person's opinion, the task force's facilitator should have been empowered as "an interim filler connector point." Specifically, this connector should have had the authority to mandate agency participation in the task force and to coordinate the agencies' actions without supplanting their respective authorities.[241]

4. Discussion of the Multiagency Task Force's Configuration

The Multiagency Task Force formed to coordinate assistance that ranged from fulfilling basic human needs, such as providing shelter, to addressing very long-term issues like disaster-related mental health for the survivors of the SR 530 incident. A wide

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[238] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

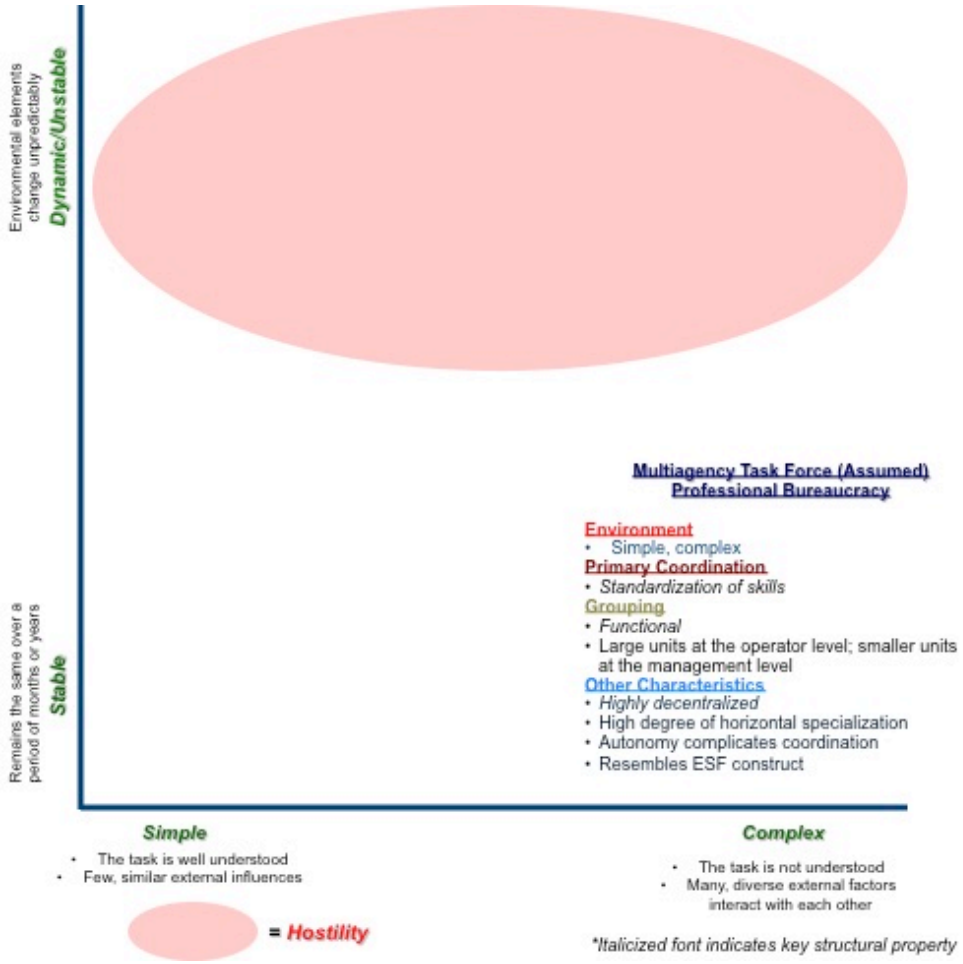
[239] Ibid..

[240] Ibid.

[241] Interview Subject E, Human Services Multiagency Task Force, December 5, 2014.

variety of public, private, and nonprofit agencies assisted in these efforts;[242] these agencies typically provide a limited scope of service to meet specific needs for their clients. When the task force formed, skilled professionals who worked within their respective entity's specific authorities represented their agencies. Without a singular authority and anticipating these skilled professionals would continue to deliver their services in "silos" that matched their agency's mission, the task force would be predicted to configure as a Professional Bureaucracy (shown in Figure 13).

Figure 13. Assumed Configuration of the Human Services Multiagency Task Force before the Analysis of the Interviews



[242] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

In this situation, the key requirement was for the Multiagency Task Force to coordinate the efforts of different programs and agencies in a rapidly changing environment. This pulled this Professional Bureaucracy toward adhocratic behavior that included a reliance on mutual adjustment and the ability to quickly form small groups tailored to each survivor's needs. Mintzberg noted that professional bureaucracies tend to forego new solutions in favor of standard programs[243] and that an adhocracy is a configuration that "innovates and solves problems directly on behalf of its clients."[244]

The emergence of an adhocracy's characteristics acknowledged the nature of the challenge of providing a full array of assistance to a diverse population of survivors. The agencies never ceded their individual authorities and relied on each individual's expertise within that authority, so the group maintained characteristics of a Professional Bureaucracy and an Adhocracy. This is a hybrid Mintzberg called the Professional Bureau/Adhocracy; this research deems it a Professional Adhocracy. This configuration, depicted in Figure 14, created a structure the participants characterized as "flat" or "very flat"[245] and one in which "nobody is telling us what to do [and] we are not telling anybody else what to do."[246] At the same time, it allowed the group to leverage its members' expertise and experience while enhancing their effectiveness by allowing those experts the latitude to respond to the task environment's complexity and rapid change.

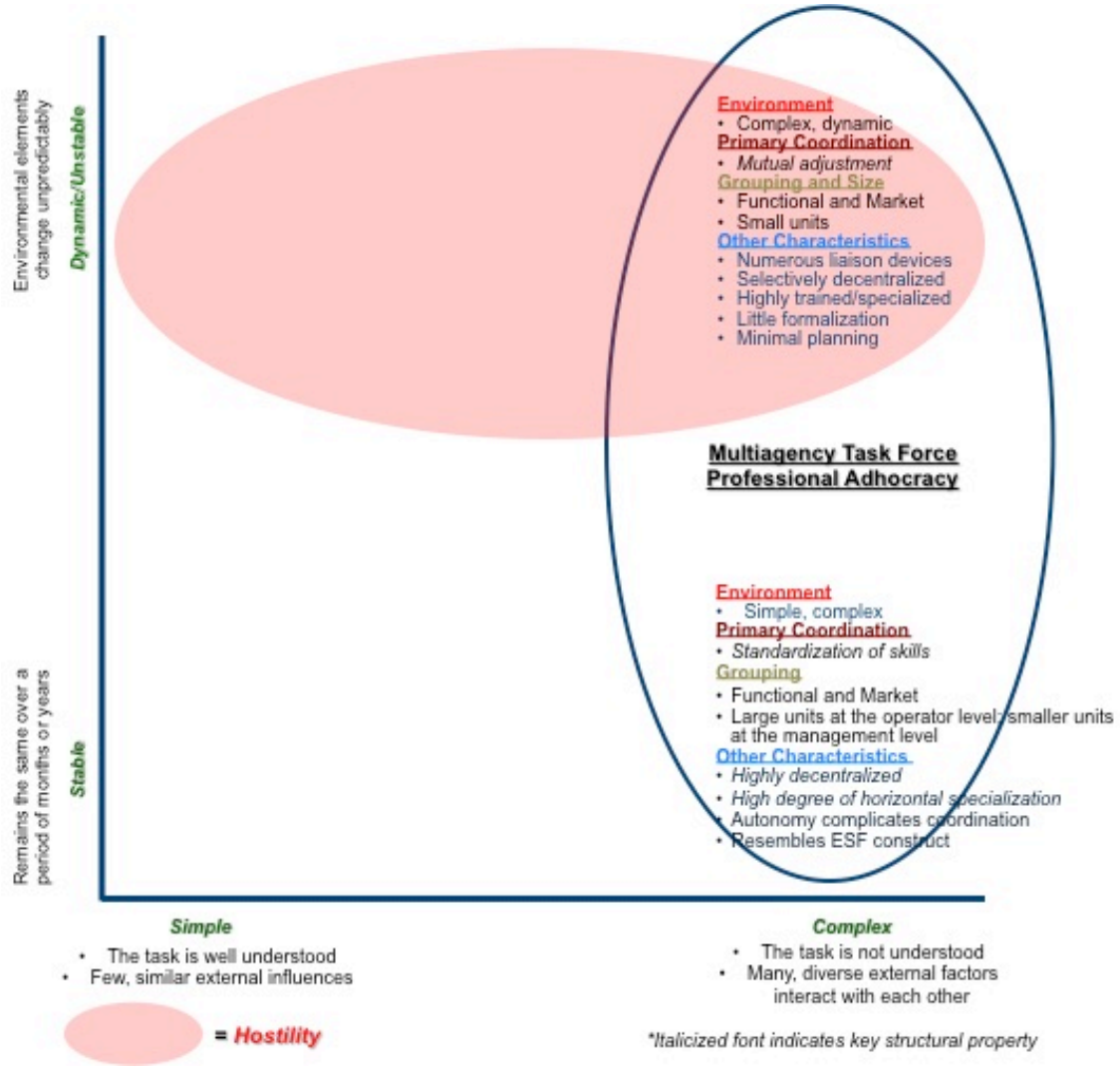
[243] Mintzberg, *Structure in Fives*, 257.

[244] Ibid.

[245] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014; Interview Subject E, Human Services Multiagency Task Force, December 5, 2014; Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

[246] Interview Subject F, Human Services Multiagency Task Force, December 17, 2014.

Figure 14. Human Services Multiagency Task Force's Configuration during the SR 530 Incident Based on the Analysis of the Interviews



The responses indicated that while retaining their authorities improved effectiveness, it hampered efficiency. Some of this could be attributed to the sheer size of the group, which greatly exceeded the doctrinal definition of span of control[247] but was generally associated with increased effectiveness. It was clear from the interview participants that the lack of defined authority affected efficiency. Unlike the SR 530 Task Force, which had a single authority, this group more closely adhered to configuration

[247] Interview Subject D, Human Services Multiagency Task Force, November 21, 2014.

theory's definition of a task force (which emphasizes equal participation) than the doctrinal definition.[248] Without an authority (i.e., a person or agency in charge), the group lacked a means to centralize; this precluded its ability to adhere to Mintzberg's assertion about the need to centralize during extreme hostility and further impeded its efficiency. Establishing a means to centralize would have expedited decision-making.

A better understanding of configuration theory could have identified the effect of time pressures and the need to establish a single authority. It could have also identified other factors in the task environment that influenced the configuration but could have been mitigated. For example, although little could change the perceptions of complexity that came from the number of issues the group needed to address, the number of agencies involved, and the lack of previous experience, instability could have been addressed. The rapid turnover in people and programs, which created instability, could have been managed through the commitment of staff availability and agency engagement. Examples such as this become clearly recognizable when viewed through the lens of configuration theory.

D. CROSS-CASE RESULTS AND DISCUSSION

The analysis of all of the interview subjects' responses revealed that they shared certain perceptions of their task environments, their groups' structural properties, and the groups' configurations. This section communicates those shared perceptions with an embedded discussion based on the literature. Because all of the groups experienced these issues, the author considered them more generalizable.

In their task environments, the three groups' experiences demonstrated that: (a) a high number of external factors involved generated complexity, (b) a lack of predictable and consistent staffing created instability, and (c) although relative, time affected all of them greatly. As such, EOC managers may want to plan for, or be prepared to specifically address, these factors of the environment during large-scale, no-notice incidents.

[248] DHS, "National Incident Management System," 55. The NIMS document defines a task force as "Any combination of resources assembled in support of a specific mission or operational need."

To address the tasks assigned to them, it would have been difficult for the two task forces to reduce the number of agencies; however, the Logistics Section may have mitigated the complexity caused by the presence of so many agencies by focusing the staff on its "simple, simple task."[249] Focusing on the routine work of processing a resource request might have minimized the distraction caused by the number of agencies and the overall magnitude of the incident. Meanwhile, all of the groups might have reduced their sense of instability by minimizing staff turnover and ensuring consistent scheduling. Finally, earlier recognition and implementation of ways to reach decisions more quickly (e.g., through centralization) may have reduced the effect of time pressures.

The groups shared some commonalities in their organization's structural properties. Every group used liaison devices, some of which did not fit those found in current emergency management doctrine. Those included the task force (Mintzberg's description) and integrating managers. The latter appeared in the two task forces, both of which far exceeded the span of control recommended by the NIMS document.[250] This may indicate that multiple liaison devices can overcome span of control issues on large-scale incidents. Functional grouping, featured by all of the groups, may have also helped mitigate their large size. In terms of other coordination mechanisms, all of the groups prominently featured the use of mutual adjustment, but the research noted that it was cited as a factor that both contributed to effectiveness and one that degraded efficiency. In a time-constrained environment, which is what each group described, recognizing this trade-off affords the opportunity for EOC managers to make informed decisions regarding the comprehensiveness or timeliness of a group's efforts.

The common theme in these groups' configuration was that one size did not fit all. All of them implemented a hybrid that leveraged aspects of more than one of Mintzberg's five basic configurations. This appeared attributable to their need to respond to multiple valid forces, a circumstance that Mintzberg found "perfectly logical."[251]

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[249] Interview Subject G, SCEOC Logistics Section, November 14, 2014.

[250] DHS, "National Incident Management System," 47. According to the NIMS document, the span of control should range from three to seven, with five being optimal.

[251] Mintzberg, *Structure in Fives*, 290.

While little may have seemed logical to the members of these groups responding to the unprecedented nature of this incident, the need for their organizations to complete tasks in distinct environments that were subject to rapid change was clear. Less logical was the pull of some toward behaviors that did not fit the environment, for example, the Logistics Section's adamant advocacy of standardized processes. Mintzberg did state that contradictory situational factors beyond an organization's control could drive them toward dysfunctional hybrids. He specifically cited instances where highly trained operators (Professional Bureaucracy) working for governmental entities are pushed toward Machine Bureaucracy.[252] This may explain the responses from the Logistics Section's representatives.

E. SUMMARY

This chapter presented the results of the analysis of nine interviews and discussions based on the reviewed literature. The results revealed the factors that affected the groups' task environments, the structural properties that appeared in the groups, and participants' perceptions of the impact on their respective group's performance. The discussions focused on the configuration of each group and offered opportunities, grounded in configuration theory, to improve the performance of each group.

At both the workgroup level and across the teams, an understanding of configuration theory might have led to an earlier recognition of the task environment and provided the EOC's management with options better suited for the conditions. The next chapter provides comprehensive recommendations for emergency management doctrine and training, suggestions for future research, and the conclusion to this study.

[252] Mintzberg, *Structure in Fives*, 289–90.

VI. CONCLUSION

The results of the analyses provide some validation of configuration theory's utility within the context of an EOC. At its outset, this research hypothesized that an understanding of configuration theory might help emergency managers organize the staff in an EOC in a manner that enhances the staff's performance. To explore that hypothesis, the author conducted semi-structured interviews with members of three distinct workgroups that formed during the SCEOC's response to a large scale, no-notice incident.

The initial analysis of the qualitative data provided by those interviews resulted in the identification of factors that shaped each workgroup's respective task environment and the features (i.e., structural properties) of their organizations; it also provided the basis for a discussion of their configurations. A second analysis extrapolated themes shared by all three of the workgroups. These analyses demonstrated examples where an understanding of configuration theory might well have allowed EOC managers to proactively configure, or make more responsive adjustments to the configuration of, the organization, and that these changes would have improved the organization's effectiveness and/or efficiency. The following sections summarize the findings, discuss the implications and recommendations related to the findings, and offer some suggestions for future research.

A. SUMMARY OF FINDINGS

Using the lens of configuration theory, this research examined three workgroups that formed during the SCEOC's response to the SR 530 flooding and mudslides incident. The author analyzed nine participants' perspectives to determine the factors that shaped each group's task environment and the structural properties that the group adopted, or those that emerged. The following is a synopsis of the findings from the SCEOC Logistics Section, the SR 530 Task Force, and the Human Services Multiagency Task Force.

The SCEOC Logistics Section supported the resource needs of the incident's responders. It preexisted the SR 530 incident; in previous exercises and incidents it performed routine work using a standardized work process, but found that process overwhelmed by this situation. In response to the loss of a standardized process and needing to perform work in a moderately complex, dynamic, and very time critical environment, the workgroup adopted specific structural properties. First, in response to the time criticality, the section's leaders took a more prominent role in coordinating the workgroup's efforts. Second, to address the complexity, the members of the group used adhocratic behavior (e.g., mutual adjustment) to coordinate with each other. These remained the prevalent means of performing their work until a standardized work process was reestablished and, with it, a routine work environment. The interview participants cited a lack of standardized work process and the sheer complexity of the incident as detriments to the group's performance, but agreed that the group's ability to interact informally helped them be effective. They also clearly communicated the value of the section chief's direction in helping the group perform its task efficiently in the absence of a standard process.

The SR 530 Task Force formed after the incident; its task was to clear the debris from SR 530 so the road could be reopened. Composed of subject-matter experts in their respective disciplines, this workgroup was asked to perform complex work under significant time constraints and for which there was no previous knowledge. The expertise of the members helped them identify solutions to the problems posed by this novel situation; the workgroup's facilitator became instrumental in coordinating the *timely* efforts of the disparate disciplines. As a group, the participants felt that they performed their task very effectively, but that the lack of an emphatic decision-making authority hindered their efficiency.

The third group was the Human Services Multiagency Task Force. Like the SR 530 Task Force, this workgroup formed after the incident. Its task was to support the survivors of the tragedy. Many, many organizations offered assistance, and this group's size approached 200 participants. The task force was established to provide a mechanism to coordinate efforts and provide comprehensive services that addressed an incredibly

wide spectrum of need (complex) as quickly as possible (time critical) in an evolving environment (dynamic). The representatives of the agencies were experts in their respective areas of service and committed to helping people; the lack of a singular authority to direct them led to duplicated efforts. Such duplication meant that they effectively completed their work, but lacked efficiency in doing so.

All of the groups interacted with a large number of external factors and stakeholders, which generated complexity. They also experienced a lack of consistent staffing, and that resulted in instability. Time criticality was also a recurring, albeit relative, theme. In these task environments, liaison devices and the ability to coordinate informally among peers (i.e., mutual adjustment) were cited as particularly useful, helping to mitigate the incident's complexity by facilitating coordination externally and internally, respectively. At least one of the liaison devices implemented, the integrating manager, is not currently found in EOC doctrine. The findings also indicated that these groups relied on very flexible structures (i.e., hybrid configurations), which incorporated aspects of multiple configurations. For the Logistics Section and the SR 530 Task Force, this was particularly important as these groups faced the simultaneous needs to make decisions in a time-constrained environment (i.e., increase their efficiency) and to problem solve in complex environments (i.e., increase their effectiveness). For the Human Services Multiagency Task Force, the hybrid configuration allowed it to leverage the representatives' expertise to provide holistic support to the survivors while maintaining agency integrity.

B. OVERARCHING IMPLICATIONS AND RECOMMENDATIONS

This research suggests the need to consider fundamental changes to EOC doctrine and training. In Chapter I, the author contended that current EOC doctrine and training are incomplete because they are narrowly focused, primarily relying on the on-scene ICS as the basis for organizing an EOC. The analysis demonstrated the benefits of understanding how and why to configure an organization, which requires comprehension of the relationship between the task environment and the configuration. It provided

examples of how specific structural properties enhance or hinder a group's performance. All of this is found within configuration theory's concepts and principles.

Configuration theory does not advocate a best structure; it contends that the structure must fit the task environment. In the changing environment that is disaster response, EOC staff should expect to have to adapt. Knowing the parameters of configuration theory can guide the efforts of leaders in an EOC to implement adaptive organization design; therefore, this research recommends that EOC doctrine and training expand to include configuration theory. This expansion should include definitions of the factors that influence the task environment and the structural properties of organizations. Because an EOC's focus is primarily on coordination, particular attention should be paid to configuration theory's coordinating mechanisms. Doctrine and training should also highlight the different ways to configure an organization, including hybrid configurations. It is further recommended that appropriate learning objectives for emergency management training and education be developed to include an appropriate level of understanding of configuration theory.

C. SUGGESTIONS FOR FUTURE RESEARCH

Despite the critical role EOCs play during disasters, there is a dearth of qualitative or quantitative research on their performance; therefore, they deserve to be the subject of future studies. This research examined multiple teams within a single case study to begin to identify ways to improve the performance of an EOC by using configuration theory. The nature of the case study's incident is what Yin classified an extreme case,[253] and it offers many unique opportunities for future research.

For example, subsequent research on how to improve EOC performance could focus on the individuals who staffed the SCEOC. Mintzberg articulated the importance of designing individual positions and specifically mentioned the effects of job specialization, behavior formalization, and training/indoctrination.[254] While this research focused on the unit, studying the individuals would provide insight into how to better

[253] Yin, *Case Study Research*, 47.

[254] Mintzberg, *Structure in Fives*, 25–44.

coordinate the efforts of the individual staff members. Conversely, a study could also be conducted to assess the EOC comprehensively (i.e., assess the overarching organization). Ultimately, the individuals and disparate sections have an inherently limited effect on the success of the community's response efforts. The entire EOC, however, delivers significantly greater impact. A starting point for this analysis could be Mintzberg's assertion that a hybrid exists that uses different configurations in the various parts of the organization.[255]

Of course, the lack of previous research also means that any comparative studies would further the understanding of how to improve EOC performance. Those could be analyses of individual positions, sections, or EOCs *in toto* operating in similar or different task environments. Another opportunity is an examination of the competing requirements posed by complexity (which in this case study led to decentralized problem solving) and time criticality (which in this case study pulled the groups toward centralized decision-making). From the author's perspective, there is simply a need to add to a knowledge base that empirically improves EOC performance.

D. CLOSING COMMENTS

The staff in an EOC must perform well. When an EOC is activated, a community is usually facing a disaster; its EOC plays a critical role in the response. This was true during the response to the SR 530 Flooding and Mudslides, and the goal of this research was to identify ways that may improve the EOC staff's performance. Configuration theory offers a way.

Configuration theory states that organizations that configure themselves based upon their task environment are more likely to perform well. This thesis examines if adhering to this premise might benefit an EOC's staff. The author's analysis of interviews of members of three workgroups revealed aspects of each group's configuration that worked well in their respective task environments and others that did not. It also provided examples of instances where the application of configuration theory might have improved effectiveness and efficiency in the SCEOC.

[255] Mintzberg, *Structure in Fives*, 290.

There is no way to go back in time to verify such assertions. Moving forward, the hope is that the findings of this research will inform EOC doctrine and training and inspire future studies that will cumulatively improve EOCs' performance across the nation. The increasing frequency of disasters and the importance of local EOCs reinforce the need to improve. This thesis offers important insights from one tragedy; the emergency management discipline should endeavor to build upon them.

APPENDIX. INTERVIEW PROTOCOL

Date of Interview: _____

Thank you for taking the time to talk with me. By agreeing to be interviewed, you indicate that you understand the information gathered may be part of this research. The responses will be used in a way that respects and ensures your privacy, and all individual contributions will remain confidential. The interview will take approximately one hour to complete.

This study is voluntary and you have the right not to answer any question.

Thank you in advance for your participation.

Purpose of the Study

The topic of this research is to determine the effectiveness of various organizational designs on emergency operations center (EOC) activities. The purpose of this interview is to discover perceptions and reflections about organizational factors that impacted groups' performance during the response to the SR 530 slide incident, which occurred in Snohomish County, Washington, in March 2014. It is believed that this research may highlight the applicability of a variety of organizational structures in EOCs.

Interviewee Information

Work group: _____

1. Select one of the below to describe your group's level of disaster-related training.
    a. The group had no disaster-related training.
    b. The group had minimal disaster-related training.
    c. The group had moderate disaster-related training.
    d. The group had significant disaster-related training.

2. Select one of the below to describe your group's disaster-related experience.
    a. The group had no previous disaster experience.
    b. The group had minimal disaster experience.
    c. The group had moderate disaster experience.
    d. The group had significant disaster experience.

Questionnaire

Place an X on of the line below to demonstrate the level of complexity of your group's task.

Simple Complex

Structured Question:

1. Describe your group's task and why you placed the X where you did.

Follow-Up Probes:

1. Describe the amount of certainty or uncertainty you perceive your group felt about completing its task.
2. How did the task complexity affect task performance?

Place an X on the line below to show how time criticality affected your group.

Very Little Very Much

Structured Questions:

1. Describe how time affected the group's decision-making.
2. Describe how time affected the group's problem solving.

Place an X on the line below to describe your group's processes.

Formalized Ad Hoc

Structured Questions:

1. Describe a specific example of a problem your group had to solve a problem and how that was addressed.

2. Describe a specific example of a decision that had to be made and how that was accomplished.

Follow-up Probe:

1. Did the group behave differently between decision-making and problem solving?

Place an X on of the line below to describe the organizational structure used by your group.

Hierarchy Flat

Structured Questions:

1. Describe your group's structure and why you placed the X where you did.
2. Describe the effect of the structure on the speed of your group's processes.
3. Describe the effect of the structure on the effectiveness of your group's processes.
4. How did the structure affect your group's ability to work with other stakeholders?

Follow-Up Probes:

1. How was coordination accomplished?
2. How was authority delegated for group members to coordinate?
3. If faced with a problem of similar complexity, describe how you would structure your group.
4. Did the structure offer adequate flexibility to meet changing needs or uncertainties? Give specific examples of why or why not.

Earlier you were asked questions regarding the group's level of training and experience.

Structured Questions:

1. How did the group's experience affect the structure and its ability to complete its task?
2. Did other factors, such as the individual participant's professionalism, affect either the structure or the processes? If so, how?

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